 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

FOURTH SEMESTER – **APRIL 2012**

# PH 4959 – PARTICLE PHYSICS

Date : 23-04-2012 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **APPLIED HISTORY**

FIRST SEMESTER – **NOVEMBER 2011**

# HT 1807 - HISTORY OF MODERN ASIA

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

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10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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**PART - C**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **APPLIED HISTORY**

FIRST SEMESTER – **NOVEMBER 2011**

# HT 1808 - CULTURAL HERITAGE OF INDIA

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **APPLIED HISTORY**

FIRST SEMESTER – **NOVEMBER 2011**

# HT 1810 - SOCIO-ECONOMIC & CULTURAL HISTORY OF MODERN T.N.

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

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8. Give the equation which expresses the conservation of electron lepton number.

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **APPLIED HISTORY**

FIRST SEMESTER – **NOVEMBER 2011**

# HT 1811 - HISTORY OF MODERN SCIENCE

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - B**

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**PART - C**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **APPLIED HISTORY**

FIRST SEMESTER – **NOVEMBER 2011**

# HT 1811 - RESEARCH METHODOLOGY

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **APPLIED HISTORY**

FIRST SEMESTER – **NOVEMBER 2011**

# HT 1812 - WORLD CIVILIZATION

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

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**PART - B**

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **APPLIED HISTORY**

FIRST SEMESTER – **NOVEMBER 2011**

# HT 1813 - INTELECTUAL HISTORY OF INDIA

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

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**PART - B**

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

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17. (a) Establish the Lorentz invariance of the Dirac equation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **APPLIED HISTORY**

THIRD SEMESTER – **NOVEMBER 2011**

# HT 3810 - STATE COLONIALISM AND MODERNITY

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - B**

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15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **APPLIED HISTORY**

THIRD SEMESTER – **NOVEMBER 2011**

# HT 3811 - HISTORIOGRAPHY

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - B**

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**PART - C**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **APPLIED HISTORY**

THIRD SEMESTER – **NOVEMBER 2011**

# HT 3812 - INDIA IN INTERNATIONAL RELATIONS

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - C**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

FIRST SEMESTER – **NOVEMBER 2011**

# EC 1806 - MICRO ECONOMIC THEORY - I

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - B**

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

FIRST SEMESTER – **NOVEMBER 2011**

# EC 1807 - MACRO ECONOMIC THEORY - I

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

FIRST SEMESTER – **NOVEMBER 2011**

# EC 1808 - ENVIRONMENTAL ECONOMICS

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

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5. What is lepton universality ?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

FIRST SEMESTER – **NOVEMBER 2011**

# EC 1809 - MATHS & STATISTICS FOR ECONOMISTS

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

FIRST SEMESTER – **NOVEMBER 2011**

# EC 1810 - INTERNATIONAL ECONOMICS

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

FIRST SEMESTER – **NOVEMBER 2011**

# EC 1950 - SOCIAL ECONOMICS

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

FIRST SEMESTER – **NOVEMBER 2011**

# EC 1951 - AGRICULTURAL ECONOMICS

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

THIRD SEMESTER – **NOVEMBER 2011**

# EC 3808 - MONETARY ECONOMICS

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

THIRD SEMESTER – **NOVEMBER 2011**

# EC 3809 - PUBLIC ECONOMICS - I

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

THIRD SEMESTER – **NOVEMBER 2011**

# EC 3810 - RESEARCH METHODS IN ECONOMICS

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ECONOMICS**

THIRD SEMESTER – **NOVEMBER 2011**

# EC 3811 - APPLIED ECONOMETRICS

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# EL 1803 - INDIAN WRITING IN ENGLISH - 20TH C

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# EL 1804 - LINGUISTICS

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# EL 1805 - FEMINIST THEORY AND PRACTICE

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# EL 1806 - SPEECH EVENT MANAGEMENT

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# EL 1807 - ADVANCED ACADEMIC WRITING

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# EL 1900 - BUSINESS COMMUNICATION

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

THIRD SEMESTER – **NOVEMBER 2011**

# EL 3803 - POST COLONIAL LITERATURE

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

THIRD SEMESTER – **NOVEMBER 2011**

# EL 3804 - DRAMA (BRITISH & AMERICAN) FROM 1900

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

THIRD SEMESTER – **NOVEMBER 2011**

# EL 3808 - DISCOURSE ANALYSIS

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

THIRD SEMESTER – **NOVEMBER 2011**

# EL 3809 - LITERARY HISTORY - I

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

THIRD SEMESTER – **NOVEMBER 2011**

# EL 3810 - LITERARY HISTORY - II

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **ENGLISH LITERATURE**

THIRD SEMESTER – **NOVEMBER 2011**

# EL 3875 - HUMAN RIGHTS AND SUBALTERN LITERATURE

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDIA ARTS**

FIRST SEMESTER – **NOVEMBER 2011**

# MA 1802 - STORY CONCEPTS IN TAMIL LITERATURE

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDIA ARTS**

FIRST SEMESTER – **NOVEMBER 2011**

# MA 1806 - MEDIA HISTORY

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDIA ARTS**

THIRD SEMESTER – **NOVEMBER 2011**

# MA 3805 - MEDIA MANAGEMENT

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDIA ARTS**

THIRD SEMESTER – **NOVEMBER 2011**

# MA 3806 - MEDIA RESEARCH METHODS

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDIA ARTS**

THIRD SEMESTER – **NOVEMBER 2011**

# MA 3875 - MULTI-LINGUAL CREATIVITY

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# SO 1803 - PRINCIPLES OF SOCIOLOGY

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# SO 1805 - SOCIOLOGY OF HEALTH

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# SO 1806 - INDIAN SOCIAL SYSTEM AND HEALTH

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# SO 1808 - MEDICAL ANTHORPOLOGY

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# SO 1810 - CLASSICAL SOCIOLOGICAL THEORY

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# SO 3806 - QUALITIATIVE RESEARCH METHODS

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# SO 3807 - COUNSELLING

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# SO 3809 - BIO-MEDICAL ETHICS AND LAW

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# SO 3810 - NGO MANAGEMENT

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# SO 3952 - HEALTH COMMUNICATION

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

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13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **PHILOSOPHY**

THIRD SEMESTER – **NOVEMBER 2011**

# PL 3900 - PHILOSOPHY OF HISTORY

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - B**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

FIRST SEMESTER – **NOVEMBER 2011**

# SW 1800 - S.W.PROFESSION,HIST.,PHIL.& METHODS

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

FIRST SEMESTER – **NOVEMBER 2011**

# SW 1801 - SOCIOLOGY & STUDY OF IND. SOCIETY

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

FIRST SEMESTER – **NOVEMBER 2011**

# SW 1802 - HUMAN GROWTH AND DEVELOPMENT

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

FIRST SEMESTER – **NOVEMBER 2011**

# SW 1803 - SOC. CASE WORK & SOC. GROUP WORK - I

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

THIRD SEMESTER – **NOVEMBER 2011**

# SW 3953 - RURAL ECONOMY & COOPERATION (1)

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

THIRD SEMESTER – **NOVEMBER 2011**

# SW 3954 - RURAL COMMUNITY DEVELOPMENT (1)

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

THIRD SEMESTER – **NOVEMBER 2011**

# SW 3965 - LABOUR LEGISLATION & CASE LAWS (2)

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

THIRD SEMESTER – **NOVEMBER 2011**

# SW 3966 - HUMAN RESOURCE MANAGEMENT

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

THIRD SEMESTER – **NOVEMBER 2011**

# SW 3974 - PSYCHIATRIC DISORDERS (4)

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

THIRD SEMESTER – **NOVEMBER 2011**

# SW 3975 - HEALTH SITUATION IN INDIA (3)

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

THIRD SEMESTER – **NOVEMBER 2011**

# SW 3983 - CHILDREN IN INDIA (4)

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **SOCIAL WORK**

THIRD SEMESTER – **NOVEMBER 2011**

# SW 3985 - WOMEN AND DEVELOPMENT (4)

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **TAMIL LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# TL 1800 - GRAMMAR-I THOLKAPPIAM(EZHTTHATHIGARAM)

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **TAMIL LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# TL 1801 - MODERN LITERATURE

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **TAMIL LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# TL 1802 - HISTORY OF TAMILNADU & CULTURE-I

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **TAMIL LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# TL 1803 - LITERARY CRITICISM

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **TAMIL LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# TL 1804 - TOURISM

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.A.** DEGREE EXAMINATION - **TAMIL LITERATURE**

FIRST SEMESTER – **NOVEMBER 2011**

# TL 1805 - CONTRIBUTIONS OF CHRISTIANS TO TAMIL LITT.

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

FIRST SEMESTER – **NOVEMBER 2011**

# CA 1800 - DATA STRUCTURES USING C++

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

FIRST SEMESTER – **NOVEMBER 2011**

# CA 1802 - COMPUTER ORGANIZATION AND ARCHITECTURE

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - B**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

FIRST SEMESTER – **NOVEMBER 2011**

# CA 1803 - OBJECT ORIENTED ANALYSIS AND DESIGN

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

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17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5800 - XML AND WEB SERVICES

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

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6. Are neutral current decays observed in atomic systems ? Why ?

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**PART - B**

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15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5802 - KNOWLEDGE MANAGEMENT SYSTEM

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

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**PART - B**

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15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5803 - MOBILE COMPUTING

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

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17. (a) Establish the Lorentz invariance of the Dirac equation.

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19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5952 - BIO INFORMATICS

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5953 - RESOURCE MANAGEMENT TECHNIQUES

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

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10. What is asymptotic freedom ?

**PART - B**

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13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5954 - ARTIFICIAL NEURAL NETWORK

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - C**

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16. (a) Discuss the discovery of the heavier quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3800 - DATABASE MANAGEMENT CONCEPTS

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - C**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3802 - .NET TECHNOLOGIES

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3804 - SOFTWARE ENGINEERING

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3900 - COMPUTERS IN CHEMISTRY

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3901 - E COMMERCE

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APP.**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3950 - PRINCIPLES OF FOSS

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

FIRST SEMESTER – **NOVEMBER 2011**

# CA 1800 - DATA STRUCTURES USING C++

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - B**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

FIRST SEMESTER – **NOVEMBER 2011**

# CA 1802 - COMPUTER ORGANIZATION AND ARCHITECTURE

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

FIRST SEMESTER – **NOVEMBER 2011**

# CA 1803 - OBJECT ORIENTED ANALYSIS AND DESIGN

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

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17. (a) Establish the Lorentz invariance of the Dirac equation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5800 - XML AND WEB SERVICES

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5802 - KNOWLEDGE MANAGEMENT SYSTEM

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

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7. Estimate the coupling constant between the electron field and the Higgs field .

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5803 - MOBILE COMPUTING

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

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9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5952 - BIO INFORMATICS

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

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19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5953 - RESOURCE MANAGEMENT TECHNIQUES

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

FOURTH SEMESTER – **NOVEMBER 2011**

# CA 5954 - ARTIFICIAL NEURAL NETWORK

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

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**PART - B**

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3800 - DATABASE MANAGEMENT CONCEPTS

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3802 - .NET TECHNOLOGIES

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

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17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3804 - SOFTWARE ENGINEERING

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3900 - COMPUTERS IN CHEMISTRY

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3901 - E COMMERCE

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.C.A.** DEGREE EXAMINATION - **COMPUTER APPLICATIONS**

THIRD SEMESTER – **NOVEMBER 2011**

# CA 3950 - PRINCIPLES OF FOSS

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

FIRST SEMESTER – **NOVEMBER 2011**

# CO 1807 - FINANCIAL MANAGEMENT

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

FIRST SEMESTER – **NOVEMBER 2011**

# CO 1808 - STRATEGIC MARKETING MANAGEMENT

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

FIRST SEMESTER – **NOVEMBER 2011**

# CO 1809 - ORGANISATIONAL BEHAVIOUR

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

FIRST SEMESTER – **NOVEMBER 2011**

# CO 1810 - MODERN BUSINESS STATISTICS

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

FIRST SEMESTER – **NOVEMBER 2011**

# CO 1811 - BUSINESS ENVIRONMENT AND POLICIES

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

THIRD SEMESTER – **NOVEMBER 2011**

# CO 3802 - SECURITY ANALYSIS & PORTFOLIO MANAGEMENT

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

THIRD SEMESTER – **NOVEMBER 2011**

# CO 3803 - BRAND MANAGEMENT

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

THIRD SEMESTER – **NOVEMBER 2011**

# CO 3804 - RESEARCH METHODOLOGY

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

THIRD SEMESTER – **NOVEMBER 2011**

# CO 3807 - ENTREPRENEURSHIP AND SMALL BUSINESS MANAGEMENT

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

THIRD SEMESTER – **NOVEMBER 2011**

# CO 3808 - CREATIVE ADVERTISING

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Com.** DEGREE EXAMINATION - **COMMERCE**

THIRD SEMESTER – **NOVEMBER 2011**

# CO 3901 - ACCOUNTING AND FINANCIAL MANAGEMENT

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# BT 1819 - MICROBIAL PHYSIOLOGY & GENETICS

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# BT 1820 - ADVANCED BIOCHEMISTRY

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# BT 1821 - CELL AND MOLECULAR BIOLOGY

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# BT 1822 - IMMUNOLOGY & IMMUNOTECHNOLOGY

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# BT 3816 - ANIMAL CELL BIOTECHNOLOGY

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# BT 3817 - PLANT MOLECULAR BIOLOGY

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# BT 3820 - RESEARCH TECHNIQUES & SCIENTIFIC WRITING

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# BT 3821 - INTELLECTUAL PROPERTY RIGHTS

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# BT 3901 - MEDICAL MICROBIOLOGY

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# BT 3953 - PHARMACEUTICAL BIOTECHNOLOGY

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO TECHNOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# BT 3954 - MARINE BIOTECHNOLOGY

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO-MEDICAL INSTRUMENTATION SCIENCE**

FIRST SEMESTER – **NOVEMBER 2011**

# BI 1808 - TOOLS & TECHNIQUES IN CELL BIOLOGY

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO-MEDICAL INSTRUMENTATION SCIENCE**

FIRST SEMESTER – **NOVEMBER 2011**

# BI 1809 - CLINICAL BIOCHEMISTRY

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO-MEDICAL INSTRUMENTATION SCIENCE**

FIRST SEMESTER – **NOVEMBER 2011**

# BI 1810 - HAEMATOLOGY

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO-MEDICAL INSTRUMENTATION SCIENCE**

FIRST SEMESTER – **NOVEMBER 2011**

# BI 1811 - ADVANCED MOLECULAR BIOLOGY

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO-MEDICAL INSTRUMENTATION SCIENCE**

THIRD SEMESTER – **NOVEMBER 2011**

# BI 3809 - HUMAN PHYSIOLOGY

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO-MEDICAL INSTRUMENTATION SCIENCE**

THIRD SEMESTER – **NOVEMBER 2011**

# BI 3810 - TECHNICAL PATHOLOGY

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIO-MEDICAL INSTRUMENTATION SCIENCE**

THIRD SEMESTER – **NOVEMBER 2011**

# BI 3813 - BIOSTATISTICS

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**Answer any FOUR questions: (4x7.5 = 30)**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIOMED.INSTRUMENTATION SC.**

FIRST SEMESTER – **NOVEMBER 2011**

# BI 1808 - TOOLS & TECHNIQUES IN CELL BIOLOGY

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - B**

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIOMED.INSTRUMENTATION SC.**

FIRST SEMESTER – **NOVEMBER 2011**

# BI 1809 - CLINICAL BIOCHEMISTRY

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIOMED.INSTRUMENTATION SC.**

FIRST SEMESTER – **NOVEMBER 2011**

# BI 1810 - HAEMATOLOGY

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIOMED.INSTRUMENTATION SC.**

FIRST SEMESTER – **NOVEMBER 2011**

# BI 1811 - ADVANCED MOLECULAR BIOLOGY

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIOMED.INSTRUMENTATION SC.**

THIRD SEMESTER – **NOVEMBER 2011**

# BI 3809 - HUMAN PHYSIOLOGY

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIOMED.INSTRUMENTATION SC.**

THIRD SEMESTER – **NOVEMBER 2011**

# BI 3810 - TECHNICAL PATHOLOGY

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **BIOMED.INSTRUMENTATION SC.**

THIRD SEMESTER – **NOVEMBER 2011**

# BI 3813 - BIOSTATISTICS

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

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(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

FIRST SEMESTER – **NOVEMBER 2011**

# CH 1806 - ORGANIC REACTION MECHANISM & STEREOCHEMISTRY

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

FIRST SEMESTER – **NOVEMBER 2011**

# CH 1807 - CONCEPTS IN INORGANIC CHEMISTRY

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

FIRST SEMESTER – **NOVEMBER 2011**

# CH 1808 - QUANTUM CHEMISTRY & GROUP THEORY

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

FIRST SEMESTER – **NOVEMBER 2011**

# CH 1809 - ANALYTICAL CHEMISTRY

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

THIRD SEMESTER – **NOVEMBER 2011**

# CH 3808 - PHOTOCHEMISTRY AND ORGANIC SYNTHESIS

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

THIRD SEMESTER – **NOVEMBER 2011**

# CH 3809 - COORDINATION CHEMISTRY

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

THIRD SEMESTER – **NOVEMBER 2011**

# CH 3810 - MOLECULAR SPECTROSCOPY

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

THIRD SEMESTER – **NOVEMBER 2011**

# CH 3812 - CHEMICAL KINETICS

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

THIRD SEMESTER – **NOVEMBER 2011**

# CH 3875 - MATERIAL SCIENCE

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **CHEMISTRY**

THIRD SEMESTER – **NOVEMBER 2011**

# CH 3901 - INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SC.**

FIRST SEMESTER – **NOVEMBER 2011**

# CS 1810 - DESIGN & ANALYSIS OF ALGORITHM

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SC.**

FIRST SEMESTER – **NOVEMBER 2011**

# CS 1812 - COMPUTER NETWORKS

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SC.**

FIRST SEMESTER – **NOVEMBER 2011**

# CS 1813 - SOFTWARE ENGINEERING METHODOLOGY

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SC.**

FIRST SEMESTER – **NOVEMBER 2011**

# CS 1814 - ADVANCED COMPUTER ARCHITECTURE

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SC.**

THIRD SEMESTER – **NOVEMBER 2011**

# CS 3812 - DATA WAREHOUSING

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SC.**

THIRD SEMESTER – **NOVEMBER 2011**

# CS 3813 - TCP/IP PROTOCOL

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

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9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SC.**

THIRD SEMESTER – **NOVEMBER 2011**

# CS 3814 - LINUX PROGRAMMING AND DRIVER DEVELOPMENT

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

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9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SC.**

THIRD SEMESTER – **NOVEMBER 2011**

# CS 3816 - NETWORK PROGRAMMING

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SCIENCE**

FIRST SEMESTER – **NOVEMBER 2011**

# CS 1810 - DESIGN & ANALYSIS OF ALGORITHM

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SCIENCE**

FIRST SEMESTER – **NOVEMBER 2011**

# CS 1812 - COMPUTER NETWORKS

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SCIENCE**

FIRST SEMESTER – **NOVEMBER 2011**

# CS 1813 - SOFTWARE ENGINEERING METHODOLOGY

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SCIENCE**

FIRST SEMESTER – **NOVEMBER 2011**

# CS 1814 - ADVANCED COMPUTER ARCHITECTURE

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SCIENCE**

THIRD SEMESTER – **NOVEMBER 2011**

# CS 3812 - DATA WAREHOUSING

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

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(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SCIENCE**

THIRD SEMESTER – **NOVEMBER 2011**

# CS 3813 - TCP/IP PROTOCOL

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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**PART - B**

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**PART - C**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SCIENCE**

THIRD SEMESTER – **NOVEMBER 2011**

# CS 3814 - LINUX PROGRAMMING AND DRIVER DEVELOPMENT

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

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5. What is lepton universality ?

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7. Estimate the coupling constant between the electron field and the Higgs field .

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9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

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**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **COMPUTER SCIENCE**

THIRD SEMESTER – **NOVEMBER 2011**

# CS 3816 - NETWORK PROGRAMMING

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

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**PART - B**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

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(b) Obtain the Lagrangian of quantum electrodynamics.

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(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **FOOD CHEMISTRY & FOOD PROCESSING**

FIRST SEMESTER – **NOVEMBER 2011**

# FP 1800 - INORGANIC,PHYSICAL & ANALYTICAL CHEMISTRY

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **FOOD CHEMISTRY & FOOD PROCESSING**

FIRST SEMESTER – **NOVEMBER 2011**

# FP 1801 - ORGANIC CHEMISTRY OF FOOD - I

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **FOOD CHEMISTRY & FOOD PROCESSING**

FIRST SEMESTER – **NOVEMBER 2011**

# FP 1802 - APPLICATIONS OF SPECTROSCOPY

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **FOOD CHEMISTRY & FOOD PROCESSING**

FIRST SEMESTER – **NOVEMBER 2011**

# FP 1803 - HUMAN NUTRITION

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **FOOD CHEMISTRY & FOOD PROCESSING**

THIRD SEMESTER – **NOVEMBER 2011**

# FP 3800 - FUNDAMENTALS OF AGRO PRODUCTS

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **FOOD CHEMISTRY & FOOD PROCESSING**

THIRD SEMESTER – **NOVEMBER 2011**

# FP 3801 - FOOD FROM ANIMAL SOURCES

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **FOOD CHEMISTRY & FOOD PROCESSING**

THIRD SEMESTER – **NOVEMBER 2011**

# FP 3802 - FOOD PROCESSING - AGRO PRODUCTS

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **FOOD CHEMISTRY & FOOD PROCESSING**

THIRD SEMESTER – **NOVEMBER 2011**

# FP 3803 - CHEMISTRY OF FOOD ADDITIVES

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **FOOD CHEMISTRY & FOOD PROCESSING**

THIRD SEMESTER – **NOVEMBER 2011**

# FP 3804 - SCIENCE AND SOCIETY

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

FIRST SEMESTER – **NOVEMBER 2011**

# MT 1810 - LINEAR ALGEBRA

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

FIRST SEMESTER – **NOVEMBER 2011**

# MT 1811 - REAL ANALYSIS

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

FIRST SEMESTER – **NOVEMBER 2011**

# MT 1812 - ORDINARY DIFFERENTIAL EQUATIONS

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

FIRST SEMESTER – **NOVEMBER 2011**

# MT 1813 - DIFFERENTIAL GEOMETRY

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

FIRST SEMESTER – **NOVEMBER 2011**

# MT 1814 - COMPUTER ALGORITHMS

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

FIRST SEMESTER – **NOVEMBER 2011**

# MT 1902 - MATHEMATICS FOR COMPUTER APPLICATIONS

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

THIRD SEMESTER – **NOVEMBER 2011**

# MT 3810 - TOPOLOGY

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

THIRD SEMESTER – **NOVEMBER 2011**

# MT 3811 - COMPLEX ANALYSIS

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

THIRD SEMESTER – **NOVEMBER 2011**

# MT 3812 - CLASSICAL MECHANICS

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

THIRD SEMESTER – **NOVEMBER 2011**

# MT 3960 - NUMBER THEORY AND CRYPTOGRAPHY

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

THIRD SEMESTER – **NOVEMBER 2011**

# MT 3961 - FINANCIAL MATHEMATICS

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

THIRD SEMESTER – **NOVEMBER 2011**

# MT 3962 - NUMERICAL METHODS USING MATLAB

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MATHEMATICS**

THIRD SEMESTER – **NOVEMBER 2011**

# MT 3963 - COMBINATORICS

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL LAB. TECHNOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# ML 1808 - CLINICAL BIOCHEMISTRY

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL LAB. TECHNOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# ML 1809 - MOLECULAR BIOLOGY

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL LAB. TECHNOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# ML 1810 - HAEMATOLOGY

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL LAB. TECHNOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# ML 1953 - HOSPITAL MANAGEMENT

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL LAB. TECHNOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# ML 1954 - MEDICAL TRANSCRIPTION

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL LAB. TECHNOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# ML 3807 - FLUID ANALYSIS

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL LAB. TECHNOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# ML 3808 - HUMAN PHYSIOLOGY

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY.**

FIRST SEMESTER – **NOVEMBER 2011**

# SO 1803 - PRINCIPLES OF SOCIOLOGY

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY.**

FIRST SEMESTER – **NOVEMBER 2011**

# SO 1805 - SOCIOLOGY OF HEALTH

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY.**

FIRST SEMESTER – **NOVEMBER 2011**

# SO 1806 - INDIAN SOCIAL SYSTEM AND HEALTH

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY.**

FIRST SEMESTER – **NOVEMBER 2011**

# SO 1808 - MEDICAL ANTHORPOLOGY

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY.**

FIRST SEMESTER – **NOVEMBER 2011**

# SO 1810 - CLASSICAL SOCIOLOGICAL THEORY

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY.**

THIRD SEMESTER – **NOVEMBER 2011**

# SO 3806 - QUALITIATIVE RESEARCH METHODS

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY.**

THIRD SEMESTER – **NOVEMBER 2011**

# SO 3807 - COUNSELLING

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY.**

THIRD SEMESTER – **NOVEMBER 2011**

# SO 3809 - BIO-MEDICAL ETHICS AND LAW

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY.**

THIRD SEMESTER – **NOVEMBER 2011**

# SO 3810 - NGO MANAGEMENT

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **MEDICAL SOCIOLOGY.**

THIRD SEMESTER – **NOVEMBER 2011**

# SO 3952 - HEALTH COMMUNICATION

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

FIRST SEMESTER – **NOVEMBER 2011**

# PH 1812 - ELECTRODYNAMICS

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

FIRST SEMESTER – **NOVEMBER 2011**

# PH 1813 - ELECTRONICS

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

FIRST SEMESTER – **NOVEMBER 2011**

# PH 1814 - CLASSICAL MECHANICS

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

FIRST SEMESTER – **NOVEMBER 2011**

# PH 1815 - STATISTICAL MECHANICS

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

THIRD SEMESTER – **NOVEMBER 2011**

# PH 3810 - SOLID STATE PHYSICS - I

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

THIRD SEMESTER – **NOVEMBER 2011**

# PH 3811 - RELATIVITY AND QUANTUM MECHANICS

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

THIRD SEMESTER – **NOVEMBER 2011**

# PH 3812 - NUMERICAL METHODS AND C PROGRAMMING

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

THIRD SEMESTER – **NOVEMBER 2011**

# PH 3951 - CRYSTAL PHYSICS

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **PHYSICS**

THIRD SEMESTER – **NOVEMBER 2011**

# PH 3952 - GRAVITATION AND COSMOLOGY

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

FIRST SEMESTER – **NOVEMBER 2011**

# ST 1814 - MEASURE AND PROBABILITY

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

FIRST SEMESTER – **NOVEMBER 2011**

# ST 1815 - ADVANCED DISTRIBUTION THEORY

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

FIRST SEMESTER – **NOVEMBER 2011**

# ST 1816 - APPLIED REGRESSION ANALYSIS

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

FIRST SEMESTER – **NOVEMBER 2011**

# ST 1817 - STATISTICAL COMPUTING - I

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

THIRD SEMESTER – **NOVEMBER 2011**

# ST 3811 - MULTIVARIATE ANALYSIS

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

THIRD SEMESTER – **NOVEMBER 2011**

# ST 3812 - STOCHASTIC PROCESSES

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

THIRD SEMESTER – **NOVEMBER 2011**

# ST 3814 - STATISTICAL COMPUTING - II

Date : 04-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

THIRD SEMESTER – **NOVEMBER 2011**

# ST 3901 - STATISTICAL APPLICATIONS IN BIOLOGICAL SCIENCES

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

THIRD SEMESTER – **NOVEMBER 2011**

# ST 3902 - STATISTICS FOR ECONOMISTS

Date : 10-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

THIRD SEMESTER – **NOVEMBER 2011**

# ST 3955 - DATA WAREHOUSING AND DATA MINING

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **STATISTICS**

THIRD SEMESTER – **NOVEMBER 2011**

# ST 3956 - ACTUARIAL STATISTICS

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **VISUAL COMMUNICATION**

FIRST SEMESTER – **NOVEMBER 2011**

# VC 1800 - IMAGE AND IMAGINATION

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **VISUAL COMMUNICATION**

FIRST SEMESTER – **NOVEMBER 2011**

# VC 1812 - INFORMATION COMMUNICATION TECHNOLOGY

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **VISUAL COMMUNICATION**

FIRST SEMESTER – **NOVEMBER 2011**

# VC 1814 - COMMUNICATION & CULTURE

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **VISUAL COMMUNICATION**

THIRD SEMESTER – **NOVEMBER 2011**

# VC 3808 - COMMUNICATION RESEARCH METHODS

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **VISUAL COMMUNICATION**

THIRD SEMESTER – **NOVEMBER 2011**

# VC 3809 - MEDIA EFFECTS AND ETHICS

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **ZOOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# ZO 1813 - PHYLOGENY OF INVERTEBRATA AND CHORDATA

Date : 01-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **ZOOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# ZO 1814 - ANIMAL DIVERSITY AND BIOSYSTEMATICS

Date : 03-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **ZOOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# ZO 1815 - ADVANCED EVOLUTIONARY BIOLOGY

Date : 05-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **ZOOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# ZO 1816 - ADVANCED DEVELOPMENTAL BIOLOGY

Date : 09-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

(b) Obtain an expression for the total dynamical contribution to the Lagrangian density associated with the gauge fields B and W.

19. Explain the construction of the Lagrangian density for the electro-weak interaction of the quarks.

20. Explain why colour symmetry is not readily apparent in the particles, baryons and mesons formed from quarks by the strong interaction .

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **ZOOLOGY**

FIRST SEMESTER – **NOVEMBER 2011**

# ZO 1817 - HISTOCHEMISTRY & MICROTECHNIQUE

Date : 11-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

10. What is asymptotic freedom ?

**PART - B**

**Answer any FOUR questions: (4x7.5 = 30)**

11. Discuss the solution of the K-G equation and its relevance to the Standard Model.

12. Show that the electromagnetic field appears as a consequence of the invariance of the Lagrangian of quantum electrodynamics under a local symmetry transformation.

13. Discuss Higg’s mechanism of introducing mass into a theory.

14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

**Answer any FOUR questions: (4x12.5 =50)**

16. (a) Discuss the discovery of the heavier quarks.

(b) Find the Lagrangian density which describes massive particles having intrinsic spin 1.

17. (a) Establish the Lorentz invariance of the Dirac equation.

(b) Obtain the Lagrangian of quantum electrodynamics.

18. (a) Construct a Lagrangian density which is invariant under a local SU(2) transformation as well as a local U(1) transformation.

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **ZOOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# ZO 3809 - ENVIRONMENTAL MANAGEMENT

Date : 31-10-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

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**PART - C**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **ZOOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# ZO 3810 - INTEGRATED PHYSIOLOGY

Date : 02-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

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**PART - B**

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 LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION - **ZOOLOGY**

THIRD SEMESTER – **NOVEMBER 2011**

# ZO 3900 - MEDICAL LABORATORY TECHNOLOGY

Date : 12-11-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART - A**

**Answer ALL questions: (10x2=20)**

1. State two properties of the known quarks.

2. How can one conclude that the d quark is heavier than the u quark ?

3. What are spinors ?

4. What is meant by charge conjugation ?

5. What is lepton universality ?

6. Are neutral current decays observed in atomic systems ? Why ?

7. Estimate the coupling constant between the electron field and the Higgs field .

8. Give the equation which expresses the conservation of electron lepton number.

9. What is meant by saying that the gluon fields are confining on a length scale greater than 1 Fermi?

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**PART - B**

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14. Discuss the coupling of the lepton fields to the Z gauge field.

15. Discuss the quark-anti quark interaction at short distances.

**PART - C**

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