LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **BIOTECHNOLOGY**

FIRST SEMESTER – NOVEMBER 2015

BT 1825 - MOLECULAR BIOLOGY & MOL. GENETICS

Date : 03/11/2015 Dept. No. Max. : 100 Marks

Time : 01:00-04:00

PART – A **(20 marks)**

Answer ALL the Questions

I. Choose the correct answer **(5 x 1 = 5)**

1. What is the size of bacterial genome in bp?
   a) 4.6×10^6 b) 5.6×10^2 c) 3.6×10^2 d) 3.6×10^2

2. The size of eukaryotic ribosome is _____ S
   a) 10 b) 70 c) 80 d) 90

3. "UUU" codes for which amino acid?
   a) Phenyl alanine b) Valine c) Glycine d) Tyrosine

4. Receptor is always a _____
   a) Protein b) Lipid c) Sugar d) Hormone

5. What should be the value of "p + q" in Hardy-Weinberg Law (HWL) of equilibrium?
   a) 1 b) 0.1 c) 0.01 d) 10

II. State whether the following are true or false, if false, give reason **(5x1=5)**

6. Repetitive DNA renatures faster than the unique DNA.
7. In eukaryotic cell, protein synthesis takes place in the nucleus.
8. There are 4 codons coding for amino acid Glycine.
9. The size of lipid bilayer is 20 nm.
10. "Kappa" particles are seen in sensitive strains of *Paramecium.*

III. Complete the following **(5 x 1= 5)**

11. Myotonic dystrophy is caused due to _____.
12. Polyadenylation takes place at _____ end of mRNA.
13. "Att" sequence is required for _____ type of recombination.
14. "ATP" is required for _____ transport across membrane in a eukaryotic cell.
15. There are _____ shades of eye colours in humans.

IV. Answer the following, each within 50 words **5 x 1 = 5)**

16. Define nucleoid.
17. What is a spliceosome?
18. Enlist various stop codons with their respective names.
19. What is pinocytosis?
20. How do you calculate allele frequency of a gene in a population using HWL equation?

PART B

Answer the following, each within 500 words. (5 x 8 = 40 marks)
Draw diagrams wherever necessary

21. (a) Enlist the characteristics of satellite DNAs.

OR

b) Explain Scaffold Associated Regions (SAR).

22. (a) Discuss various RNA processing events with diagrams.

OR

(b) Distinguish between silencers and enhancers.

23. (a) What is codon bias and elaborate it with an example.

OR

(b) Differentiate between euchromatin and heterochromatin.

24. (a) Give an account on enzyme linked signal transduction with diagram

OR

(b) Give the differences between active and passive transports.

25. (a) What are the differences between qualitative and quantitative inheritances. Cite two examples of each type.

OR

(b) What is linkage? How do you prove that the genes are linked?

PART – C

Answer any TWO of the following, each within 1500 words. (2 x 20 = 40 Marks)
Draw diagrams wherever necessary.

26. Describe the organization of prokaryotic genome.
27. Explain the various steps involved in eukaryotic protein synthesis.
28. Illustrate semi-conservative mode of DNA replication using Meselson and Stahl experiments in *E. coli* .
29. Schematically explain the extrachromosomal inheritance in *Paramecium*.

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