LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIRST SEMESTER – **APRIL 2016**

BT 1826 – BIOCHEMISTRY & BIOPHYSICS

Date: 28-04-2016 Dept. No. Max. : 100 Marks

Time: 01:00-04:00

PART –A (20 Marks)

Answer ALL the questions

I. Choose the correct answer (5x1= 5 Marks)

1) What will be the pH of 1M HCl?
   a) 0 b) 1 c) 7 d) 14
2) Choose a negatively charged amino acid from the following
   a) Aspartate b) Serine c) Histidine d) Arginine
3) Among the following which enzyme is regulated in glycolysis?
   a) Hexokinase b) Fumarase c) Ketoglutarate d) Citrate synthase
4) The source of UV light in a spectrophotometer is
   a) Hydrogen lamp b) Deuterium lamp c) Xenon lamp d) Neon lamp
5) Which of the following technique is used to separate charged molecules?
   a) Ion exchange chromatography b) Polyacrylamide gel electrophoresis
   c) HPLC d) Gas chromatography

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

6) Energy from one form can be transformed to the other.
7) The torsion angle between Cα and C is φ.
8) All lipids undergo oxidation in the cytoplasm.
9) Gas chromatography is based on boiling point of the substance.
10) Bromophenol blue is a tracking dye in polyacrylamide gel electrophoresis.

III. Complete the following (5x1= 5 Marks)

11) The theoretical bond angle of water is _____.
12) A tripeptide contains _____ peptide bonds.
13) The total number of ATP generated in glycolysis is _____.
14) The functional study of brain is done using_____.
15) _____ is used to determine the structure of proteins in solution.

IV. Answer the following, each within 50 words only (5x1= 5 Marks)

16) State the first law of thermodynamics.
17) Give an example for epimers.
18) Name the defective enzyme associated with Tay Sachs disease.
19) Mention the principle behind Ultrasound imaging.
20) Define isoelectric point (pI).

PART-B **(5x8=40 Marks)**

Answer the following, each within 500 words. Draw diagrams wherever necessary

21) (a) Derive the Henderson- Hasselbalch equation for weak acids.

OR

(b) Mention any eight properties of water.

22) (a) Discuss the structure of homo polysaccharides and hetero polysaccharides with two examples each.

OR

(b) List the general properties, sources and deficiency diseases of fat soluble vitamins.

23) (a) Write an overview on the complete metabolism of glucose.

OR

(b) Comment on Phenylketonuria and Fabry's disease.

24) (a) Illustrate the principle behind Ion Exchange Chromatography.

OR

(b) Employ a technique to separate cellular organelles from a cell suspension culture.

25) (a) Explain the torsion angles using Ramachandran plot.

OR

(b) Briefly explain any two methods to prepare crystals for X-ray diffraction.

PART-C **(2x20= 40 Marks)**

Answer any TWO of the following, each within 1500 words. Draw diagrams wherever necessary

26) Classify amino acids and discuss the structural hierarchy of proteins.

27) Write in detail the synthesis, transport and oxidation of fatty acids.

28) Elaborate the principle, instrumentation and applications of HPLC and GLC.

29) Describe separation of proteins using two dimensional gel electrophoresis.

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