



Date: 02-11-2016
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

PART – A

Answer ALL the Questions

I. Choose the correct answer

(5 x 1 = 5 Marks)

- Which of the following is has high entropy?
a)Liquid water b) Ice c)Water vapour d) both a & b
- Pick out the amino acid with the neutral R group from the following:
a)Aspartate b) Serine c) Histidine d)Arginine
- What is the source of light in an analytical centrifuge?
a) Hydrogen lamp b) Deuterium lamp c) Tungsten lamp d) Xenon lamp
- Which of the following technique is used for nondestructive imaging of rare fossils?
a) Positron emission tomography b) Magnetic resonance imaging
c) Confocal imaging d) Computed tomography
- Which of the following separates proteins based on mass and charge ratio
a) Gel filtration b) Mass spectrophotometer c) SDS-PAGE d) IEF

II. State whether the following are true or false

(5 x 1 = 5 Marks)

- Water in ponds freeze from top to bottom.
- Nucleotide bases are acidic in nature.
- Palmitic acid can enter mitochondria without carnitine shuttle.
- Beer –Lambert’s law forms the basis of spectrophotometry.
- X-rays possess low energy.

III. Complete the following

(5 x 1= 5 Marks)

- _____ is an imaging technique that works on the principle of nuclear magnetic resonance.
- The dye used to track protein migration is _____.
- The theoretical bond angle in water molecule is _____
- The fatty acid containing 20 carbons and four unsaturated bonds is _____
- _____ is an epimer of D-glucose.

IV. Answer the following, each within 50 words

(5 x 1 = 5 Marks)

- State the first law of thermodynamics
- What are diastereomers?
- Why do fats provide more energy than carbohydrates?
- State Beer-Lambert’s law
- Provide the Bragg’s equation

PART – B

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

21. a. Write short notes on;

- (i) High energy phosphates (ii) Bicarbonate buffer system

OR

b. Derive the Henderson-Hasselbalch equation.

22. a. Explain any four classes of amino acids with their general structure.

OR

b. List out the functions of Vitamin A and Vitamin C.

23. a. Outline the steps in on Glycolysis.

OR

b. Provide the steps involved in the biosynthesis of AMP and GMP from IMP.

24. a. Outline the steps in cellular fractionation using centrifugation.

OR

b. Comment on ultrasound as a suitable imaging technique.

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

OR

b. Briefly discuss biological crystal preparation methods.

PART – C

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

(2×20 = 40 Marks)

26. Elaborate on pH scale, Henderson-Hasselbalch equation and pH meter.

27. Write in detail about the steps involved and energetics of complete oxidation of glucose.

28. Prepare and explain a table of five metabolic disorders showing defective pathways.

29. Elaborate on isoelectric focusing and mass spectrometric analysis of proteins
