

(6 pages)

S.No. 2678

P 22 CHCC 1B

(For candidates admitted from 2022–2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Chemistry – Core Choice Course

BIO-PHYSICAL CHEMISTRY

Time : Three hours

Maximum : 75 marks

PART A — (20 marks)

Answer ALL questions.

I. Multiple choice questions: (5 × 1 = 5)

1. The properties of integral membrane proteins can be studied by

- (a) Atomic force microscopy
- (b) Cryo-sectioning and electron microscopy
- (c) Freeze-fracture technique and electron microscopy
- (d) All of the above

2. Which of the following is an endergonic process?

- (a) Production of carbon dioxide during respiration
- (b) Frying an egg
- (c) Burning a candle
- (d) A campfire burning

3. What is the osmotic pressure of a solution containing 3.42 g of cane sugar in 1 litre solution at 27°C molar mass of cane sugar is 342 g.

- (a) 0.246 atm
- (b) 2.46 atm
- (c) 0.2 atm
- (d) 1 atm

4. Which fragment moves most quickly during the gel electrophoresis?

- (a) Large fragments
- (b) Small fragments
- (c) Large genome
- (d) None of the above

5. Which of the following statements is true about proteins?

- (a) Proteins are made up of amino acids.
- (b) Proteins are essential for the development of skin, teeth and bones.
- (c) Protein is the only nutrient that can build, repair and maintain body tissues.
- (d) All of the above

II. Fill in the blanks. (5 × 1 = 5)

6. The osmotic pressure of one molar solution at 0° C is _____.
7. _____ Forces are involved in biopolymer interaction.
8. _____ DNA and RNA have the same constituting units?
9. _____ proposed the double-helix model of DNA.
10. Muscular contraction is _____.

III. Answer the following questions. (5 × 2 = 10)

11. Difference between exergonic and endergonic reaction.
12. How to calculate average dimension for various chain structure?
13. Define: Osmotic pressure.
14. Name any two biopolymer solution.
15. Gives notes on sedimentation velocity.

PART B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b).

16. (a) Explain the structure and function of enzymes.

Or

- (b) How do you synthesis ATP from ADP?

17. (a) Write a note on statistical distribution end to end dimension.

Or

- (b) Discuss the structures of polypeptide and protein.

18. (a) What are forces involved in biopolymer interaction?

Or

- (b) Write about hydrogen ion titration curves.
19. (a) Explain about muscular contraction in mechanochemical system?

Or

- (b) List out the thermodynamic properties of biopolymer solution.
20. (a) List out the uses of nerve conduction.

Or

- (b) Write a short note on Hydrodynamic methods diffusion.

PART C — ($3 \times 10 = 30$)

Answer any THREE questions.

21. Explain the structure and function of DNA and RNA.
22. Give details on chain configuration of macromolecule.
23. What are various types of binding process in biological system? Explain.

24. State and explain the following

- (a) Osmotic pressure;
(b) Membrane equilibrium

25. Illustrate the structure and function of cell membrane.
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