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**PG (CBCS)**
**M.SC Semester- II Examination, 2023**
**ZOOLOGY**
**PAPER: ZOO 202**
**(BIOPHYSICS & BIOCHEMISTRY)**

**Full Marks: 40** **Time: 2 Hours**

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
**Write the answer for each unit in separate sheet**

## UNIT: ZOO 202.1
## BIOPHYSICS
### GROUP-A

1. Answer any **TWO** from the following questions: 2×2=4
   a) The earth is an 'open as well as closed' system-justify.
   b) What is reverse osmosis? Exemplify its application.
   c) Point out the differences between facilitated diffusion and active transport with examples.
   d) Distinguish between solid aerosol and liquid aerosol with examples.

### GROUP-B

2. Answer any **TWO** from the following questions: 2×4=8
   a) What do you mean by isoelectric pH of a protein? Explain with the help of suitable illustration, what happens to the ionic status of a protein if the pH of the medium is lowered below or raised above its isoelectric pH? 1+3
   b) Distinguish between symport and antiport with examples. 4
   c) How does fluorescence recovery after photobleaching prove the mobility of protein molecules through the lipid bilayer of plasma membrane. 4
   d) What is dialysis? Write a note on clinical importance of dialysis in renal failure patients. 1+3

### GROUP-C

3. Answer any **ONE** from the following questions: 1×8=8
   a) Explain first law of thermodynamics. Why is the law explained with reference to a closed system only?
   Describe the design and operation of the electron gun of a TEM. 3+1+4
   b) Write a note on asymmetric distribution of proteins in cell membrane and the significance thereof. Distinguish between flip-flop movement and translational movement of lipid molecules in cell membrane. 6.84 g of sucrose (molecular weight = 342) is dissolved in 200 ml water at $27^0$C. Calculate the osmotic pressure of the solution. 3+2+3

**(P.T.O)**

**UNIT: ZOO 202.2**

**BIOCHEMISTRY**

**GROUP-A**

4. Answer any **TWO** from the following questions: 2×2=4
   a) How does hydrogen bonding affect protein stability?
   b) Why are beta sheets called pleated? Where is it found?
   c) What do you mean by allosteric modulation?
   d) How proton motive force is used to drive ATP synthesis?

**GROUP-B**

5. Answer any **TWO** from the following questions: 2×4=8
   a) What are catecholamines? Briefly describe the biosynthetic pathways of nonepinephrine biosynthesis. 1+3
   b) Differentiate ammonotelism, ureotelism and uricotelism with examples.
   c) Explain competitive and noncompetitive inhibition with proper graphical representation.
   d) Why is the TCA cycle considered an amphibolic pathway?

**GROUP-C**

6. Answer any **ONE** from the following questions: 1×8=8
   a) Why is β-oxidation called so? Describe β-oxidation of Palmitic acid. How many ATPs are formed by this process? 1+5+2
   b) Write down the key steps and regulations of gluconeogenesis from pyruvate. What is Cori cycle? 5+3

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