

2021

## BOTANY — HONOURS

Paper : CC-12

(Biochemistry)

Full Marks : 50

*The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer briefly the following (**any five**) : 2×5
- What is epimer? Name the C-2 epimer of glucose.
  - Distinguish between co-valent and non co-valent bonds.
  - Why pH7 is considered as neutral pH?
  - Name one organic buffer and write down its components.
  - What is 'iso-electric point'? Why it is significant in protein-purification?
  - What is rancidity of lipids?
  - Distinguish between lyase and ligase enzymes.
2. Answer **any two** of the following :
- Define free radicals with examples. Mention their significant roles in plant metabolism. 5
  - State the two laws of thermodynamics. Explain exergenic and endergenic reactions in relation to Gibb's free energy. 2+3
  - All monosaccharides are reducing sugars but not all disaccharides. — Why? Mention the types of polysaccharides with examples. 3+2
  - Discuss redox potential with reference to electrochemical gradient. 5
3. Answer **any three** of the following :
- Give one example and chemical structure each of acidic amino acid, semi essential amino acid, polar amino acid and ketogenic amino acid. (1+1½)×4
  - Distinguish between nucleotide and nucleoside with structures. Give two examples of nucleotide derivatives. Give a brief account of non-genetic RNA. 4+2+4
  - Explain uniport, symport and antiport with examples. Distinguish between passive and active ion uptake mechanisms in plants. 6+4
  - Define co-factor, co-enzyme, prosthetic group and apo-enzyme. Graphically describe the effect of substrate concentrations on the velocity of an enzyme catalyzed reaction mentioning  $V_0$ ,  $V_{max}$  and  $K_m$ . 4+6
  - Why are membrane lipids called amphipathic? What is PUFA? Write down the structure of the fatty acids 18 : 2 ( $\Delta^9, 12$ ) and 20 : 4 ( $\Delta^5, 8, 11, 14$ ). 3+2+5
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