

U.G. 1st Semester Examination - 2021**Molecular Biology****[HONOURS]****Generic Elective Course (GE)****Course Code : MBG-101-T-GE-1****(Biological Chemistry)**

Full Marks : 40

Time : $2\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*1. Answer any **five** questions from the following:

2×5=10

- a) Explain the molecular basis of albinism.
- b) Which vitamin deficiencies are responsible for pellagra, keratomalacia, scurvy and osteomalacia?
- c) State the difference between mode of action of steroid and peptide hormones.
- d) Differentiate between co-enzymes and co-factors.

- e) According to the most recent concept, how many molecules of ATP are produced when one glucose molecule is metabolized under aerobic condition?
- f) State the function of heparin and Chondroitin sulfate.
- g) What is epimersim? Mention one epimer of glucose. 1+1
- h) Mention the different kinds of lipids present in the plasma membrane of a cell.

2. Answer any **two** of the following: 5×2=10

- a) Describe the salvage pathway of nucleotide biosynthesis.
- b) Describe transamination and oxidative deamination of amino acids with suitable examples.
- c) Schematically represent urea cycle. What is the role of urea cycle in metabolic waste removal? 3+2
- d) Discuss the properties based on which different amino acids can be separated. How would you detect amino acids chemically? 3+2

[Turn Over]

3. Answer any **two** of the following: $10 \times 2 = 20$

a) What is quantum yield of photosynthesis? Explain the steps of 'Light reaction' of photosynthesis. Differentiate between C3 and C4 plants. $2+5+3$

b) Graphically represent Michaelis-Menten equation. How does the graph of enzyme activity change in presence of competitive and non-competitive inhibitors? How would you disrupt different bonds present in tertiary structure of a protein? $3+3+4$

c) Which steps/enzymes of glycolysis and Krebs cycle are important for its regulation? What is the significance of mitochondrial membrane potential in ATP synthesis? Mention the hormonal regulation of gluconeogenesis.

$$5+2\frac{1}{2}+2\frac{1}{2}$$

d) What is the structural basis of functional difference between starch, cellulose and glycogen? Draw the Haworth projection of Sucrose. What is anomer? What is the biological significance of glycosides?

$$3+2+2+3$$