

U.G. 1st Semester Examination - 2020**MOLECULAR BIOLOGY****[PROGRAMME]****Course Code : MBG-101-T-CC-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** of the following: $2 \times 5 = 10$
- Differentiate between cyclic and non-cyclic photophosphorylation.
 - What is aldose-ketose isomerism?
 - What are PUFA and MUFA? Give examples. $1+1$
 - State the role of Vitamin D in Calcium metabolism.
 - Draw the Haworth projection formula of Lactose.
 - Explain the chemical reaction of Osazone formation.

[Turn Over]

- In which biological structure would you find hyaluronic acid and peptidoglycan?
- Describe Oxidative deamination of amino acids with an example.

2. Answer any **two** of the following: $5 \times 2 = 10$

- Explain the de novo pathway of Nucleotide biosynthesis.
- Describe the process of β -oxidation of fatty acids and state its significance.
- Explain the structural and functional differences of Cellulose, Starch and Glycogen.
- What is/are the site(s) of urea cycle? Give a schematic representation of the urea cycle.

 $1+4$ 3. Answer any **two** of the following: $10 \times 2 = 20$

- How ATP is synthesized in the chloroplast? The term 'Dark reaction' referring to the biosynthetic phase of photosynthesis is a misnomer. Explain. What is the difference between the leaf anatomy of C₃ and C₄ plants? $5+2+3$
- What are the sites of occurrence of Glycolysis, TCA cycle and Electron Transport

Chain? Give the energy balance sheet of Glycolysis and TCA cycle. Explain the regulation of Glycolysis and TCA cycle. What is the mechanism of ATP synthesis by ATP synthase? 2+2+3+3

- c) Derive Michaelis-Menten equation and explain it graphically. What is the effect on K_m and V_{max} in case of Competitive and Non-competitive inhibition of enzyme activity? Explain (with example) the regulation of enzyme catalyzed biochemical reactions by co-enzymes.

6+2+2

- d) Explain the mechanism of action of thyroid hormone. The physico-chemical properties and three dimensional structure of a protein largely depend upon the nature of constituent amino acids and their sequence. Explain 5+5
