

FIVE YEAR INTEGRATED M.Sc., EXAMINATION 2022  
SEMESTER - I  
Paper LS-1-1-1  
**MOLECULES AND THEIR INTERACTION RELEVANT TO BIOLOGY**

Time: Three Hours

Full Marks: 60

Questions are of value as indicated in the margin.

Answer **Question No.01**

1. Write short notes on **any ten** of the following: 2 x 10 = 20
- a. Structure of lactose and sucrose
  - b. Structure of cysteine and phenylalanine
  - c. Mutarotation
  - d. Rhodopsin cycle
  - e. Define  $K_m$  and mention its significance
  - f. Functions of different RNAs
  - g. Cloverleaf model of tRNA
  - h. Structure of DNA double helix
  - i. Salient features of the DNA double helix proposed by Watson and Crick
  - j. Domain
  - k. motif
  - l.  $\beta$ -platelet

Answer **any two** from question number 2 to 4. 2 X 5 = 10

2. Differences between starch and glycogen.
3. What are the catalysts? Derive the initial rate equation of an enzyme catalyzed reaction.
4. Discuss in brief the electron transport chain of mitochondria.

Answer **any three** from question number 5 to 9. 3 X 10 = 30

5. Describe the pathway of glycolysis providing details of each reaction. (10)
  6. What is the fate of pyruvate in anaerobic conditions? How is acetyl CoA formed? Write the three reactions of TCA cycle catalyzed by dehydrogenases. (4+3+3=10)
  7. Write the chemical structures and biochemical functions of fat soluble vitamins. (10)
  8. Distinguish between competitive and non-competitive inhibitions. Discuss how these modes of inhibitions may be detected experimentally. How does the competitive inhibition may be overcome experimentally? (4+3+3=10)
  9. Explain the formation of a peptide bond. Discuss  $\alpha$ -helix of proteins. Explain about different bonds that are found in protein structures. (2+3+5=10)
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