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MCH-015

**MASTER OF SCIENCE IN
CHEMISTRY/MASTER OF SCIENCE
IN ANALYTICAL CHEMISTRY
(MSCCHEM/MSCANCHEM)**

Term-End Examination

June, 2026

MCH-015 : BIOLOGY FOR CHEMISTS

Time : 1 Hour

Maximum Marks : 25

Note : *Answer all questions. Illustrate your answers wherever required.*

1. Answer any *two* of the following questions :

$$2 \times 2\frac{1}{2} = 5$$

- (a) What is the significance of Frederick Griffith's experiment in demonstrating bacterial transformation ?
- (b) Describe the process of alcoholic fermentation in yeast cells. Write its significance.
- (c) Describe in brief the urea cycle .

2. Answer any *two* of the following questions :

$$2 \times 2\frac{1}{2} = 5$$

- (a) Describe the structure and function of Immunoglobulin M (Ig M).
- (b) Explain the role of DNA polymerase in DNA replication. How it ensures the accuracy of the process ?
- (c) How does denaturation affect the structure and function of proteins ? What factors contribute to this process ?

3. Answer any *two* of the following questions :

$$2 \times 2\frac{1}{2} = 5$$

- (a) Why is purine nucleotide cycle more active in skeletal muscles during vigorous exercise ?
- (b) Why is ATP considered the energy currency of a cell ?
- (c) Why do both natural and artificial passive immunity provide temporary protection ?

4. Answer any *two* of the following : $2 \times 2\frac{1}{2} = 5$

- (a) How does the carbon skeleton of amino acids contribute to energy production ?
What is the difference between glucogenic and ketogenic amino acids ?

- (b) Compare the structure of ATP and glycerol-1-phosphate with respect to the energy released by their hydrolysis.
 - (c) Describe in brief the different types of transport mechanisms across the cell membrane.
5. Answer any *two* of the following question :

$$2 \times 2\frac{1}{2} = 5$$

- (a) What is a zwitterion ? How does it affect titration of amino acids ?
- (b) Write a short note on the innate immune system.
- (c) Complete the following sentences depicting the steps involved in nucleotide metabolism :

The further breakdown of uracil and thymine in the liver occurs with their reduction to dihydrouracil by NADPH-dependent dehydrogenase. In the next step, the reduced pyrimidine is

split by the addition of water to dihydrouracil to yield The reaction is catalysed by This is followed by and of β -ureidopropionate to produce the end product, β -alanine. The turnover of DNA or deoxythymidine nucleotides can be estimated by measuring the concentration of in urine samples.

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