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MCH–015

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

Term-End Examination

December, 2025

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) How does the regulation of Phospho-fructokinase (PFK) in glycolysis help the cell meet its energy needs ?

(b) In the context of glycolysis, why is the interconversion of G-3-P and DHAP crucial for maintaining metabolic efficiency ?

(c) Explain the role of pyruvate in energy production under aerobic and anaerobic conditions.

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

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

(a) What is galactosemia ? How does it affect metabolism in individuals ?

(b) List the main steps of the TCA cycle. Write the significance of TCA cycle.

(c) What is the role of transamination in amino acid metabolism ? Which coenzyme is involved in the reaction ?

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

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

(a) What is the role of Acetyl CoA in metabolism ? Why can fatty acids not be converted directly into glucose ?

(b) The body ensures the brain gets energy during starvation. Give reason and explain.

(c) Immunoglobulin G (Ig G) is the most common antibody in the blood, helping fight infections and provide long-term immunity. Explain.

4. Differentiate between any ***two*** of the following pairs : $2\times2\frac{1}{2}=5$

   (a) Natural active immunity and Artificial active immunity

   (b) ATP hydrolysis and AMP hydrolysis

   (c) The role of ATP and the role of NADH in cellular metabolism

5. Write short notes on any ***two*** of the following : $2\times2\frac{1}{2}=5$

   (a) Fluid Mosaic Model of the plasma membrane

   (b) Tertiary structure of protein

   (c) Significance of genetic code

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