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MBC-005

**M. SC. (BIOCHEMISTRY)
(MSCBCH)**

Term-End Examination

June, 2025

**MBC-005 : CONCEPTS AND CONNECTIONS IN
METABOLISM**

Time : 3 Hours

Maximum Marks : 100

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Explain second law of thermodynamics. 5
(b) With the help of suitable diagrams, discuss electron transport chain of mitochondria. 15
2. (a) What is fermentation ? Elaborate with two examples. 10
(b) Describe Pentose-Phosphate pathway with a suitable flowchart. 10

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3. (a) Explain the regulation of glycogen metabolism. 10
- (b) Why is gluconeogenesis important ? Enumerate its unique reactions for the conversion of Pyruvate to Glucose. 10
4. Write detailed notes on any *two* of the following : 10+10
- (a) Glycogen storage diseases
- (b) β -oxidation of saturated fatty acids
- (c) Synthesis of unsaturated fatty acids.
5. (a) How is cholesterol synthesis regulated ? 10
- (b) What is transamination ? Give its salient features. 10
6. (a) Give an overview of amino acid catabolism. Explain catabolic pathway of amino acids yielding oxaloacetate. 10
- (b) Describe the biosynthesis of the following : 5+5
- (i) Aspartate family
- (ii) Aromatic amino acid family

7. (a) Discuss de novo synthesis of Inosine Monophosphate (IMP). 12
- (b) Enlist any *four* inhibitors of nucleotide synthesis. Mention their mechanism of action, enzyme inhibited and usage in medicine. 8
8. (a) Compare purine and pyrimidine nucleotide degradation. Explain Lesch-Nyhan syndrome. 10
- (b) Describe the role of liver as the 'metabolic hub' of the body. 10

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