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AB-233750

M.Sc. (Semester-IV) Examination, June-2025

(Backlog)

CHEMISTRY

[Paper : First]

(Biological Chemistry)

Time Allowed : Three Hours

Maximum Marks : 70

Note : Question paper is divided into four sections. Attempt questions of all four sections as per direction. Distribution of marks is given in each section.

SECTION-A

(Objective Type Questions)

1. Attempt any ten questions. Each question carries 1 mark.

[10×1=10]

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(1)

[P.T.O.]

(i) Which of the following is not one of the four main biomolecules?

- (a) Carbohydrates
- (b) Protein
- (c) Lipid
- (d) Amino Acid

(ii) What are the two main types of nucleic acids?

- (a) RNA and DNA
- (b) Protein and Carbohydrate
- (c) Lipid and Carbohydrate
- (d) RNA and Lipid

(iii) What is the building block of proteins?

- (a) Amino Acid
- (b) Fatty Acid
- (c) Monosaccharide
- (d) Nucleotide

(iv) Glycolysis is the conversion of :

- (a) Fructose into phosphoenolpyruvate
- (b) Fructose into pyruvate
- (c) Glucose into phosphoenolpyruvate
- (d) Glucose into pyruvate

(v) The nature of an enzyme is :

- (a) Lipid
- (b) Vitamin
- (c) Carbohydrates
- (d) Protein

(vi) Product of Krebs cycle essential for oxidative phosphorylation is :

- (a) NADPH and ATP
- (b) Acetyl CoA
- (c) CO_2 and oxylacetate
- (d) NADH and FADH_2

(vii) _____ accept Hydrogen from malate.

- (a) FAD
- (b) NAD
- (c) NADP
- (d) FMN

(viii) FAD is reduced in which of the reaction of the Krebs cycle?

- (a) Isocitrate to Oxaloacetate
- (b) Succinyl CoA to Succinate
- (c) Fumarate to Malate
- (d) Succinate to Fumarate

(ix) Inhibition of invertase by sucrose falls into which category of Inhibition?

- (a) Substrate inhibition
- (b) Non-competitive inhibition
- (c) Product inhibition
- (d) Competitive inhibition

(x) _____ does not cause enzyme inactivation?

(xi) The coenzymes NAD^+ , FAD, and NADP^+ are _____.

(xii) Acetyl CoA is formed from pyruvate by _____ reaction.

SECTION-B

(Very Short Answer Type Questions)

Note: Attempt **any five** questions. Each question carries **2** marks. (word limit : **25-30** words) [5×2=10]

2. (i) What is denaturation of protein?
- (ii) What is Amino-acids? Classify it.
- (iii) Describe the role of NADH and FADH_2 in the Citric acid cycle.
- (iv) Ramachandran plot can be used to predict which type of structure?
- (v) What is the difference between a coenzyme and a prosthetic group?

- (vi) What is the principle of molecular recognition?
- (vii) What is the full form of NAD, NADP, FAD?
- (viii) What is the 'Lock and Key' model of enzyme activity?

SECTION-C

(Short Answer Type Questions)

Note: Attempt any five questions. Each question carries 4 marks. (word limit : 250 words) [5×4=20]

3. (i) Define is Amino Acids? Explain the structure and functions of Amino acids.
- (ii) Write the following :
 - (a) DNA / RNA structure
 - (b) Lipoic acid
- (iii) What is the protein folding? Explain with examples.
- (iv) Explain the various form of DNA.

- (v) Explain the mechanism of action of Chymotripsin.
- (vi) Describe the oxidative phosphorylation.
- (vii) What is the gene expression? Give with example.
- (viii) What is the chiral recognition? Explain with example.

SECTION-D

(Long Answer Type Questions)

Note: Attempt any three questions. Each question carries 10 marks. (word limit : 500 words) [3×10=30]

4. (i) Write short notes on the following :
 - (a) Lipids
 - (b) Ramachandran plot
- (ii) Discuss the structure of t-RNA and function and structure of pyridoxal phosphate.
- (iii) Write the following :
 - (a) Glycolysis
 - (b) Transcription and Translation

- (iv) (a) Discuss the structure and biological functions of NAD^+ , NADP^+ and FAD .
- (b) Describe the DNA binding Protein - Zinc - finger proteins.

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