2025

(NEP—2020)

(5th Semester)

ZOOLOGY (MAJOR1)

(Biochemistry)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. Waxes are esters of fatty acids with

(a) glycerol ( ) *(b)* steroids ( )

(c) alcohol ( ) *(d)* phosphates ( )

2. Rickets is a disease due to the deficiency of vitamin

(a) A ( ) *(b)* C ( )

(c) D ( ) *(d)* K ( )

3. Which of the following is not a prosthetic group?

(a) NAD ( ) *(b)* Fe^{+++} ( )

(c) ATP ( ) *(d)* Coenzyme A ( )

4. A non-protein compound that is necessary for the function of an enzyme is

(a) holoenzyme ( ) (b) cofactor ( )

(c) core enzyme ( ) (d) apoenzyme ( )

5. Which of the following is the glycogen storing organ?

(a) Heart ( ) (b) RBC ( )

(c) Intestine ( ) (d) Liver ( )

6. In glycogenesis, glucose is phosphorylated to

(a) glucose-2-phosphate ( ) (b) glucose-4-phosphate ( )

(c) glucose-6-phosphate ( ) (d) glucose-8-phosphate ( )

7. The enzymes of the TCA cycle in a eukaryotic cell are located in the

(a) cytosol ( ) (b) endoplasmic reticulum ( )

(c) mitochondria ( ) (d) Golgi complex ( )

8. Which organ primarily synthesizes ketone bodies?

(a) Brain ( ) (b) Heart ( )

(c) Liver ( ) (d) Muscle ( )

9. Glucose is the sole source of metabolic energy in

(a) RBC ( ) (b) WBC ( )

(c) kidney ( ) (d) muscle ( )

10. What is the nature of an enzyme?

(a) Lipid ( ) (b) Vitamin ( )

(c) Carbohydrate ( ) (d) Protein ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 25)

Write short notes on *five* of the following, taking at least *one* from each Unit : 5×5=25

UNIT—I

1. Fat-soluble vitamins

2. Phospholipids

UNIT—II

3. Ribozymes

4. Competitive inhibition

UNIT—III

5. Glycogen synthase

6. Site of gluconeogenesis reactions

UNIT—IV

7. Complex I of mitochondrial electron transport system

8. Oxidative phosphorylation

(SECTION : C—DESCRIPTIVE)

(*Marks* : 40)

Answer *four* questions, taking *one* from each Unit : 10×4=40

UNIT—I

1. Give a brief account of the different types of carbohydrates and their significances. 6+4=10

2. Describe the four hierarchical levels of protein structure with diagrams. 10

UNIT—II

3. What are enzymes? Explain the Michaelis-Menten equation for enzyme action. 10

4. Discuss the properties and classification of enzymes. 5+5=10

UNIT—III

5. Describe the process of glycolysis in detail. Add a note on its significance. 7+3=10

6. Give a detailed account of β-oxidation of fatty acids with a well-labelled diagram of the mechanism. 10

UNIT—IV

7. Describe the structure of mitochondrial ATP synthase complex and the mechanism of ATP synthesis. 10

8. Discuss the various steps in urea cycle. Explain how urea cycle is linked with TCA cycle. 8+2=10

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