2023

(CBCS)

(5th Semester)

ZOOLOGY

SEVENTH PAPER

(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. How many stereoisomers will be possible for the sugar D-ribose?

(a) 4 ( )

(b) 6 ( )

(c) 8 ( )

(d) 10 ( )

2. Which of the following is the structure for tetradecanoic acid?

(a) $CH_3(CH_2)_{12}COOH$ ( )

(b) $CH_3(CH_2)_{14}COOH$ ( )

(c) $CH_3(CH_2)_5CH=CH(CH_2)_5COOH$ ( )

(d) $CH_3(CH_2)_7CH=CH(CH_2)_9COOH$ ( )

3. Enzymes that catalyze the rearrangement of atomic/functional groups without altering molecular weight or number of atoms are

(a) translocases ( )

(b) lyases ( )

(c) isomerases ( )

(d) transferases ( )

4. Which of the following vitamins is not paired correctly with their deficiency conditions?

(a) Vitamin A — Xerophthalmia ( )

(b) Vitamin B_2 — Beriberi ( )

(c) Vitamin D — Rickets ( )

(d) Vitamin K — Excessive bleeding ( )

5. Which two intermediates in glycolysis undergo isomerization?
   (a) Fructose-1, 6-bisphosphate and glucose-6-phosphate ( )
   (b) Glyceraldehyde-3-phosphate and phosphoenolpyruvate ( )
   (c) Fructose-6-phosphate and dihydroxyacetone phosphate ( )
   (d) Glucose-6-phosphate and dihydroxyacetone phosphate ( )

6. Which of the following amino acids is crucial in the process of glycogen priming?
   (a) Proline ( )
   (b) Arginine ( )
   (c) Tyrosine ( )
   (d) Lysine ( )

7. Which of the following connects complex I and II to complex III in the electron transport chain?
   (a) NADH ( )
   (b) Ubiquinone ( )
   (c) FMN ( )
   (d) Cytochrome C ( )

8. Which of the following intermediates is common to both the urea cycle and Krebs' cycle?
   (a) Fumarate ( )
   (b) Malate ( )
   (c) Oxaloacetate ( )
   (d) α-ketoglutarate ( )

9. Which of the following enzymes is not involved in beta oxidation of fatty acids?
   (a) Acyl-CoA acetyltransferase ( )
   (b) Enoyl-CoA hydratase ( )
   (c) Acyl-CoA dehydrogenase ( )
   (d) HMG-CoA lyase ( )

10. The enzyme which catalyzes the conversion of ribonucleotides to deoxyribonucleotides is
   (a) ribonucleotide reductase ( )
   (b) ribonucleotide dehydrogenase ( )
   (c) ribonucleotide isomerase ( )
   (d) ribonucleotide mutase ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 15)

Write short notes on the following : 3×5=15

UNIT—I

1. Glycosidic bonds

OR

2. Role of hydrogen bonds in protein structure

UNIT—II

3. Allosteric site of enzymes

OR

4. Vitamin C deficiency

UNIT—III

5. Glycogenin

OR

6. Significance of glycolysis

UNIT—IV

7. ATP synthase

OR

8. Pyruvate dehydrogenase complex

UNIT—V

9. Ketogenesis

OR

10. Role of carnitine shuttle

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer the following : 10×5=50

UNIT—I

1. What are lipids? Describe the different types of lipids and their significance. 10

OR

2. Write a note on the different types of amino acids and their significance. 8+2=10

UNIT—II

3. What are fat-soluble vitamins? Describe in detail each of their functions and symptoms arising from their deficiency. 2+8=10

OR

4. What are coenzymes? Describe the classification and properties of enzymes. 2+8=10

UNIT—III

5. Explain the steps involved in glycogenesis. Explain how this pathway is regulated by the hormones—insulin and glucagon. 7+3=10

OR

6. Write a note on glycogenolysis and its significance. Also add a note on how it differs from glycolysis. 8+2=10

UNIT—IV

7. Elaborate the different complexes of the electron transport chain and their functions. Explain how it is involved in the synthesis of ATP. 7+3=10

OR

8. Describe the various steps involved in the HMP shunt. What is the significance of this pathway? 8+2=10

UNIT—V

9. What is the significance of the urea cycle? Describe the steps involved in the urea cycle. 1+9=10

OR

10. Describe the various functions of fat. Write a note on the process of lipogenesis. How is lipogenesis regulated? 2+6+2=10

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