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(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. Why do glucose and fructose have different numbers of possible stereoisomers even though they are both 6-carbon sugars?

(a) They have different numbers of chiral carbons ( )

(b) They rotate the plane of polarized light in different directions ( )

(c) Due to their difference in orientation of H and OH groups in the penultimate carbon ( )

(d) They are not enantiomers of each other ( )

2. Which amino acid(s) contribute(s) to the formation of disulphide bridges in protein structures?

(a) Tyrosine only ( )

(b) Cysteine only ( )

(c) Both alanine and tyrosine ( )

(d) Both cysteine and lysine ( )

3. Which of the following statements about enzyme active site is false?

(a) Substrates are bound to active sites by multiple weak attractions. ( )

(b) The active site is a three-dimensional cleft. ( )

(c) The active site takes up a large part of the total volume of an enzyme. ( )

(d) Specificity of substrate binding depends on the precisely defined arrangement of atoms in an active site. ( )

4. Blocking of enzyme action by blocking its active sites is

(a) allosteric inhibition ( )

(b) feedback inhibition ( )

(c) competitive inhibition ( )

(d) non-competitive inhibition ( )

5. Glycogen is the storage form of _____ in animals.

(a) starch ( )

(b) glucose ( )

(c) lipid ( )

(d) fat ( )

6. The substrate used by glycogen synthase for actual polymerization is

(a) glycogenin ( )

(b) glucose 6-phosphate ( )

(c) glucose 1-phosphate ( )

(d) UDP-glucose ( )

7. One turn of the citric acid cycle produces

(a) two CO_2, three NADH, one $FADH_2$ and one ATP or GTP ( )

(b) two CO_2, two NADH, one $FADH_2$ and two ATP or GTP ( )

(c) one CO_2, one NADH, three $FADH_2$ and two ATP or GTP ( )

(d) one CO_2, two NADH, two $FADH_2$ and one ATP or GTP ( )

8. Which of the following is the complex II of the electron transport chain?

(a) NADH dehydrogenase ( )

(b) cytochrome bc 1 ( )

(c) ATP synthase ( )

(d) succinate dehydrogenase ( )

9. One of the steps involved in urea cycle is

(a) synthesis of citrulline ( )

(b) synthesis of protein ( )

(c) synthesis of ammonia ( )

(d) cleavage of carbamoyl phosphate ( )

10. The parent purine nucleotide is

(a) inosine monophosphate ( )

(b) ribose 5-phosphate ( )

(c) phosphoribosylamine ( )

(d) phosphoribosyl pyrophosphate ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 15)

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

UNIT—I

1. Differences between starch and glycogen

OR

2. Significance of cholesterol

UNIT—II

3. Induced-fit model of enzyme action

OR

4. Importance and sources of vitamin K

UNIT—III

5. Function of hexokinase in glycolysis and its significance

OR

6. Significance of glycogenolysis

UNIT—IV

7. Oxidative phase of HMP shunt and its importance

OR

8. Complex I of electron transport chain

UNIT—V

9. Hyperammonaemia

OR

10. Lipogenesis

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer the following questions : 10×5=50

UNIT—I

1. Explain in detail the classification of carbohydrates with suitable examples. 10

OR

2. Describe the structural organization of proteins. 10

UNIT—II

3. Explain the different types of enzyme inhibition. Also elaborate on the different factors that affect enzyme function. 6+4=10

OR

4. Elaborate on the types and functions of water-soluble vitamins, along with illnesses that arise from their deficiency. 10

UNIT—III

5. Describe the glycolytic pathway and its regulation. 10

OR

6. What is gluconeogenesis? Explain how it is not a direct reversal of the glycolytic pathway. 7+3=10

UNIT—IV

7. Describe the TCA cycle and explain how its products contribute to ATP synthesis. 8+2=10

OR

8. Describe the components, structure and working of the electron transport chain. 10

UNIT—V

9. Why are fat molecules more efficient sources of energy for eukaryotes? Describe the beta-oxidation pathway of fatty acids. 2+8=10

OR

10. What are ketone bodies? Describe the process of ketogenesis and its significance. 2+8=10

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