

Roll No.

E-1011(A)**M. Sc. (Fourth Semester)****EXAMINATION, May-June, 2021**

ZOOLOGY

Paper First

(Biochemistry, Metabolic Regulation and Cell Function)*Time : Three Hours]**[Maximum Marks : 80***Note :** Attempt all Sections as directed.**Section—A**

1 each

(Objective/Multiple Choice Questions)**Note :** Attempt all questions.

Choose the correct answer :

1. The basic geometry for molecules in the set below which possesses the largest bond angles is :
 - (a) Linear
 - (b) Planar triangular
 - (c) Tetrahedral
 - (d) Trihedral

2. The mineral present in the human body in larger amounts than any other cation is :
 - (a) Sodium
 - (b) Calcium
 - (c) Potassium
 - (d) Iron
3. The average size of human gene is :
 - (a) 40000 bp
 - (b) 2×10^6 bp
 - (c) 1.5×10^8 bp
 - (d) 3×10^9 bp
4. Organic substance of large molecular size is :
 - (a) Starch
 - (b) Insulin
 - (c) Lipids
 - (d) Protein
5. The pH of blood is maintained by :
 - (a) Globulin
 - (b) Mineral salt
 - (c) Albumins
 - (d) Haemoglobin

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6. Linkage present in cellulose molecules is :
- (a) β (1 \rightarrow 4)
 - (b) α (1 \rightarrow 4)
 - (c) α (1 \rightarrow 6)
 - (d) Both (b) and (c)
7. In glycoprotein the carbohydrate is in the form of disaccharides units. The number of units is :
- (a) 50-100
 - (b) 200-300
 - (c) 400-500
 - (d) 600-700
8. Disulphides bridge form between the two cysteine residues as a result of :
- (a) Oxidation of sulphhydryl group
 - (b) Reduction of sulphhydryl group
 - (c) Amide formation
 - (d) None of the above
9. Which one of the following statements about protein secondary structure is correct ?
- (a) $A_n\alpha$ helix is primarily stabilized by ionic interaction between the side chain of amino-acids.
 - (b) β -sheets exist only in anti-parallel form.
 - (c) β -turns often contain proline.
 - (d) None of the above

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10. Which of the following statements about natural sterols is incorrect ?
- (a) Cholesterol is the most abundant sterol in animal tissue.
 - (b) All the carbon atoms of cholesterol are derived from acetyl Co-A.
 - (c) β -sitosterol is the most abundant plant sterol.
 - (d) Dietary β -sterol and cholesterol are absorbed to about the same extent in the intestine of normal human.
11. Disulphide bonds most often stabilize the native structure of :
- (a) Extracellular protein
 - (b) Cholesterol
 - (c) Sitosterol
 - (d) Glucose
12. The smallest particle of water is :
- (a) an atom
 - (b) a crystal
 - (c) an element
 - (d) a molecule
13. Which one is correct about glycolysis ?
- (a) Breakdown of glucose to two molecules of pyruvate.
 - (b) Occurs in cytoplasm.
 - (c) Two NAD^+ accept, two electrons and become NAD.
 - (d) All of the above

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14. A phosphate bond contains an energy :
- (a) 7.3 kcal
 - (b) 8.3 kcal
 - (c) 10 kcal
 - (d) 11.7 kcal
15. In anaerobic respiration the process takes place is :
- (a) Kreb's cycle
 - (b) Glycolysis
 - (c) Oxidative phosphorylation
 - (d) Glycolysis and Kreb's cycle
16. Most of the energy during aerobic respiration is produced by the :
- (a) Electron transport chain
 - (b) Glycolysis
 - (c) Kreb's cycle
 - (d) Oxidative phosphorylation
17. Cytochromes are found in :
- (a) Matrix of mitochondria
 - (b) Cristae of mitochondria
 - (c) Lysosomes
 - (d) Outer wall of mitochondria
18. The power house of the cell is :
- (a) Lysosomes
 - (b) Cell membrane
 - (c) Mitochondria
 - (d) Nucleus

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19. The mitochondrial membrane contains a transporter for :
- (a) NADH
 - (b) Acetylc Co-A
 - (c) GTP
 - (d) ATP
20. How many energy bonds are expended in the formation of a peptide bond ?
- (a) 2
 - (b) 4
 - (c) 3
 - (d) 6

Section—B

2 each

(Very Short Answer Type Questions)

Note : Attempt all questions. Answer the questions in two or three sentences.

1. Describe the role of water in life.
2. Write about the concept of tetrahedral carbon atom.
3. What is the difference between D-amino acid and L-amino acid ?
4. Write names of any *eight* amino acid.
5. Write about the sources of Vitamin 'A'.
6. Explain the biological importance of nucleotides.
7. Define intracellular and extracellular enzymes.
8. Write about the effect of temperature on enzyme activity.

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Section—C

3 each

(Short Answer Type Questions)

Note : Attempt all questions. Answer the questions in about 75 words.

1. Draw the structure of water molecule.
2. Write about the molecular formula, Fittig-Baeyer formula and Fischer projection formula of glucose.
3. Describe the classification of simple proteins.
4. Explain the secondary structure of protein.
5. Describe the physiological function of Vitamin 'K'.
6. Describe the structure pyrimidine bases.
7. Classify co-enzymes on the basis of functional characteristics.
8. Describe any *six* biological roles of enzymes.

Section—D

5 each

(Long Answer Type Questions)

Note : Attempt all questions. Answer the questions in 150-200 words.

1. Explain glycogenesis in detail.

Or

Describe glycogenolysis in detail.

2. Describe 'bonds' those related to protein structure.

Or

Describe Ornithine-Urea cycle.

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3. Describe biosynthesis of purine nucleotides of De-novo.

Or

Explain the formation of uric acid.

4. Write an essay on the significance of Kreb's cycle.

Or

Describe the organisation of the respiratory chain in mitochondria (mitochondrial electron transport chain).

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