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**F-1011****M.Sc.(Fourth Semester)  
EXAMINATION, May-June, 2022****ZOOLOGY****Paper First****(Bio-chemistry, Metabolic Regulation and Cell  
Function)***Time : Three Hours]**[Maximum Marks: 80***Note- All sections as directed****Section - A****(Objective/Multiple Type Questions)****(1 mark each)****Note-Attempt all questions.****Choose the correct answer.**

- Enzymes responsible for hydrolysis reaction-
  - Oxidoreductase
  - Ligase
  - Hydrolase
  - Isomerase

- (i) Water has a high specific heat capacity/(ii) It is hard to increase or decrease the water temperature which requires a lot of heat energy/(iii) Therefore water acts as a heat buffer. These statements are-
  - (i) (ii) and (iii) are true
  - (i) (ii) and (iii) are false
  - Only (ii) and (iii) are true
  - Only (i) is false
- Water shows no reaction with which of the following?
  - Barium
  - Calcium
  - Beryllium
  - Strontium
- Identify the pairs which could be called epimers-
  - Glucose & Galactose
  - Glucose & Ribose
  - Mannose & Glucose
  - Galactose & Mannose
- Identify the compound with reducing properties-
  - Glucuronic acid
  - Mucic acid
  - Gluconic acid
  - Glucaric acid

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6. Monosaccharides can be represented by-

- (A) Maltose
- (B) Lactose
- (C) Sucrose
- (D) Galactose

7. Triose can be represented by-

- (A) Glucose
- (B) Ribulose
- (C) Ribose
- (D) Glyceraldehyde

8. Sakaguchi's reaction is specific for-

- (A) Tyrosine
- (B) Proline
- (C) Arginine
- (D) Cysteine

9. Optical activity is not shown by which of the following amino acids?

- (A) Tyrosine
- (B) Proline
- (C) Glycine
- (D) Cysteine

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10. Which amino acid shows Million-Nasse's reaction-

- (A) Tyrosine
- (B) Tryptophan
- (C) Phenylalanine
- (D) Arginine

11. A blue complex is formed by which amino acid while reacting with Ninhydrin with evolution of CO<sub>2</sub>-

- (A) Peptide bond
- (B)  $\alpha$ -Amino acids
- (C) Serotonin
- (D) Histamine

12. Which pyrimidine base is present in RNA and absent in DNA?

- (A) Guanine
- (B) Thymine
- (C) Uracil
- (D) Adenine

13. Which of the following is an example of non-reducing sugar?

- (A) Isomaltose
- (B) Maltose
- (C) Lactose
- (D) Trehalose

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14. Seliwanoff's test is positive with which of the following-

- (A) Glucose
- (B) Fructose
- (C) Lactose
- (D) Maltose

15. Which compound is similar in structure with vitamin K, and can also act as an anticoagulant?

- (A)  $\beta$ -carotene
- (B) Tocopherol
- (C) Ergocalciferol
- (D) Warfarin

16. The chemical nature of Retinol is-

- (A) Steroid
- (B) Polyisoprenoid compound with a cyclohexenyl ring
- (C) Benzoquinone derivative
- (D) 6-Hydroxychromane

17. Transport of retinol is achieved in the blood by binding with-

- (A) Aporetinol binding protein
- (B)  $\alpha$  2-Globulin
- (C)  $\beta$ -Globulin
- (D) Albumin

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18. Cyanocobalamin can cure the deficiency of which vitamin?

- (A) B<sub>1</sub>
- (B) B<sub>2</sub>
- (C) B<sub>6</sub>
- (D) B<sub>12</sub>

19. Human tissues can store which of the following vitamins?

- (A) B<sub>1</sub>
- (B) B<sub>2</sub>
- (C) B<sub>6</sub>
- (D) K

20. The class of compounds showing vitamin E activity are called-

- (A) Phytonadiones
- (B) Tocopherols
- (C) Ergocalciferols
- (D) Pyridoxines

### Section - B

#### (Very Short Answer Type Questions)

(2 marks each)

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

1. Draw the structural formula of any two monosaccharides of ketohexose group.

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2. Draw the structural formula of any two  $\omega$ -fatty acids.
3. Draw the structural formula of a tripeptide highlighting all peptide bonds.
4. Draw the  $\beta$ -sheet structure of proteins.
5. Draw the structural formula of vitamin A(Retinol).
6. Write the name of any two eicosanoid proteinoids and their main functions.
7. What are lysozymes? Give examples and functions.
8. What is oxidative phosphorylation.

### Section-C

#### (Short Answer Type Questions)

(3 marks each)

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

1. Elucidate the tertiary structure of proteins.
2. Describe the folding mechanics of proteins.
3. Differentiate between the structures of the amylose and amylopectin.
4. Describe the sources, structure and functions of vitamin B.
5. Elucidate Hypo- and Hypervitaminosis concerning vitamin E.
6. Define and explain the functions of Coenzymes.
7. Describe process of denaturation and renaturation of DNA.

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8. What are the biological functions of RNA?

### Section-D

#### (Long Answer Type Questions)

(5 marks each)

**Note : Attempt all questions. Answer the questions in about 150 words.**

1. Describe the structure, classification and functions of carbohydrates.

**OR**

Write an essay on "Carbohydrate Metabolism".

2. Write an essay on "Quaternary Structure of Proteins".

**OR**

Write an essay on "Protein Metabolism".

3. Describe the bio-chemistry of Nucleic acid metabolism.

**OR**

Describe the occurrence, structure and physiological role of fat-soluble vitamins.

4. Describe nomenclature, classification and mechanism of action of enzymes.

**OR**

Describe the biochemical steps involved in oxidative phosphorylation.

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