

**B.Sc. BIOTECHNOLOGY  
FIRST SEMESTER  
BIOCHEMISTRY AND METABOLISM  
BBT-101**

**SET  
A**

[USE OMR FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

Marks: 20

**( Objective )**

*Choose the correct answer from the following:*

*1 × 20 = 20*

- Which of the following Biomolecules simply refers to as "Staff of life"?
  - Lipids
  - Proteins
  - Vitamins
  - Carbohydrates
- Which of the following is the general formula of Carbohydrates?
  - $(C_6H_{12}O_6)_n$
  - $(C_6H_{12}O)_n$
  - $(CH_2O)_n$
  - $(C_2H_2O)_n COOH$
- Which of the following monosaccharides is the majority found in the human body?
  - D-type
  - L-type
  - LD-types
  - None of the above
- Which of the following techniques is used to determine the protein structures?
  - X-ray crystallography
  - Kryptonics X-ray vision
  - Magnetic resonance imaging (MRI)
  - None of the above
- Which of the following is the smallest carbohydrate-triose?
  - Ribose
  - Glucose
  - Glyceraldehyde
  - Dihydroxyacetone
- A short length of DNA molecule has 80 thiamine and 80 guanine bases. The total number of nucleotide in the DNA fragment is:
  - 160
  - 40
  - 320
  - 640
- All of the reactant will be converted to products:
  - Will never reach equilibrium
  - Will not occur spontaneously
  - Will proceed at a rapid rate
  - Will proceed at a rapid rate
- ATP is a:
  - Nucleoside
  - Nucleotide
  - Vitamin
  - Nucleic acid
- Metal ions that temporary binds substrate and active site of 'enzyme' is called:
  - Inhibitors
  - Coenzymes
  - Prosthetic group
  - Cofactors
- Sphingomyelins are found in:
  - Muscles
  - Nephrons
  - Brain tissues
  - Hepatocytes

11. The synthesis of glucose from fats are called:
  - a. Glycolysis
  - b. Krebs cycle
  - c. Glycogenolysis
  - d. Gluconeogenesis
12. In Krebs Cycle a six carbon compound is formed by the combination of Acetyl CoA and:
  - a. Citric acid
  - b. Malic acid
  - c. Oxaloacetic acid
  - d. Succinic acid
13. All of the following are important electrolytes except:
  - a. Potassium ions
  - b. Carbon ions
  - c. Chloride ions
  - d. Sodium ions
14. Which of the following enzyme catalyses the first step of glycolysis?
  - a. Hexokinase
  - b. Pyruvate kinase
  - c. Glukokinase
  - d. Phosphofructokinase 1
15. The repeating units of proteins are:
  - a. Glucose units
  - b. Amino acids
  - c. Fatty acids
  - d. Peptides
16. Nutritional polysaccharide is:
  - a. Starch and glycogen
  - b. Starch and chitin
  - c. Starch and cellulose
  - d. Starch and glucose
17. Enzyme which helps in changing shape of a molecule:
  - a. Ligases
  - b. Dehydrogenases
  - c. Hydrolases
  - d. Isomerases
18. The backbone of DNA is:
  - a. Hydrophilic
  - b. Hydrophobic
  - c. Neutral
  - d. Both hydrophilic and hydrophobic
19. During one Kreb cycle number of carbondioxide molecules released is:
  - a. 1
  - b. 2
  - c. 3
  - d. 4
20. Ramachandran plot is used for:
  - a. Predicting the structure of an enzyme
  - b. Predicting the structure of a protein
  - c. Predicting the secondary of proteins from primary sequence
  - d. All the above

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**( Descriptive )**

Time : 2 hr. 30 mins.

Marks : 50

[ Answer question no.1 & any four (4) from the rest ]

1. What do you mean by gluconeogenesis, when does it happen and write the enzymes involved in gluconeogenesis? Explain the process of glycolysis along with the enzymes involved in it. 3+7=
2. Describe in detail: 5+5=
  - a) Fate of pyruvate under aerobic and anaerobic condition.
  - b) Write the importance of hexose monophosphate shunt.
3. a) What are lipids, how are they classified? 5+5=  
b) Write short notes on:
  - (i) Essential fatty acid and
  - (ii) Prostaglandins
4. Define Proteins. What are the forces stabilizing the structure of proteins? 3+7=
5. Describe electron transport chain in brief.
6. a) Differentiate between denaturation and renaturation of DNA. 5+5=  
b) Differentiate between A-DNA and B-DNA.
7. Write a note on: 5+5=
  - a) Enzyme nomenclature according to Enzyme commission.
  - b) Write short note on Holoenzyme and Apoenzyme.
8. Write a note on: 5+5=
  - a) Essential and Nonessential amino acids.
  - b) Fibrous and Globular proteins.

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