

**B.Sc. ZOOLOGY**  
**FOURTH SEMESTER (REPEAT)**  
**BIOCHEMISTRY OF METABOLIC PROCESSES**  
**BSZ-403**

**SET**  
**A**

[USE OMR SHEET 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 statements is true about the regulation of metabolic pathway?
  - Metabolic regulation always depends on control by hormones
  - Most of the metabolic pathways are regulated
  - Most of the metabolic pathways are not regulated
  - Metabolic regulation does not depend on control by hormones
- What is the name of the molecule that the cell uses to directly control metabolic pathways?
  - Enzyme
  - Substrate
  - Product
  - ATP
- Which of the following cycle shows amphibolic pathway?
  - Citric acid cycle
  - Glyoxylate
  - Glycolysis
  - Lipid metabolism
- The body's central metabolic clearing house is:
  - Adipose tissue
  - Brain
  - Skeletal muscle
  - Liver
- When two reactions are connected through a common intermediate, they are said to be:
  - Regulated
  - Inhibited
  - Coupled
  - Compartmentalized
- Pyruvate is the precursor of:
  - Alanine
  - Glutamate
  - Serine
  - Proline
- Which of the following gives rise to methionine, threonine and lysine?
  - Pyruvate
  - Aspartate
  - Glutamate
  - Serine
- Which of the following is a non-essential amino acid?
  - Lysine
  - Leucine
  - Serine
  - Methionine
- In which form the nitrogen is incorporated into an amino acid?
  - Nitrite
  - Glutamate
  - Nitrate
  - Ammonium ion

0. The carbon skeleton of glycogetic amino acids is finally degraded to:
  - a.  $\alpha$ -ketoglutarate
  - b. Succinyl CoA
  - c. Fumarate
  - d. Any of the above
1. The EMP pathway in eukaryotes usually takes place in:
  - a. Nucleus
  - b. Lysosome
  - c. Mitochondria
  - d. Cytoplasm
2. The free fatty acids are transported by blood in association with:
  - a.  $\beta$ -lipoprotein
  - b. Albumin
  - c. Globulin
  - d. Hemoglobin
3. Electron transport system (ETS) is present in which of the following parts of mitochondria?
  - a. Inner membrane
  - b. Outer membrane
  - c. Matrix
  - d. Stroma
4. ATP synthesis by ATP synthase is driven by the movement of:
  - a. Protons
  - b. NADH
  - c. Electrons
  - d. All of the above
5. Glucose 6-phosphatase enzyme is present in:
  - a. Cytoplasm
  - b. Mitochondrial matrix
  - c. Lysosome
  - d. Endoplasmic reticulum
6. How many ATP is/are required for activation of fatty acid?
  - a. 1
  - b. 2
  - c. 3
  - d. 4
7. In Gluconeogenesis Glucose is produced from:
  - a. Pyruvate
  - b. Glycerol
  - c. Glutamic acid
  - d. All of them
8. Pentose Phosphate Pathway produces:
  - a. Ribose sugar
  - b. NADPH
  - c. Both a & b
  - d. None of these
9. Inhibitor of Electron Transport chain is/are:
  - a. Cyanide
  - b. Carbon Monoxide
  - c. Both a & b
  - d. None of these
10. Molecules inhibit ATP synthesis without affecting the respiratory chain and ATP synthase is called:
  - a. Inhibitor
  - b. Uncoupler
  - c. Inducer
  - d. Catalyst

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**( Descriptive )**

Time : 2 hr. 30 mins.

Marks : 50

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

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| 1. Briefly write about TCA cycle. Why TCA cycle is called amphibolic?  | 7+3=10 |
| 2. Explain regulatory steps of glycolysis. What is the fate of pyruvate?   | 7+3=10 |
| 3. What is glycogen? Write about glycogenolysis.   | 2+8=10 |
| 4. What are the differences between catabolic and anabolic pathway?<br>Write down how the metabolism of fat, carbohydrate and protein lead to the liberation of Acetyl CoA with proper illustration. | 2+8=10 |
| 5. What are the different sites where metabolism takes place? Write about the regulation of metabolism.  | 5+5=10 |
| 6. Describe the salient features and mechanism of transamination with proper illustration.   | 5+5=10 |
| 7. What is oxidative phosphorylation? How is the Proton gradient established during the Electron Transport System?   | 2+8=10 |
| 8. Describe $\beta$ -oxidation of Palmitic acid( $C_{16}$ ).   | 10     |

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