REV-01
BSZ/19/24

2023/06

SET A

B.Sc. ZOOLOGY
FOURTH SEMESTER
BIOCHEMISTRY OF METABOLIC PROCESSES
BSZ-403
[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. Which of the following statements is true about the regulation of metabolic pathway?
   a. Metabolic regulation always depends on control by hormones
   b. Most of the metabolic pathways are regulated
   c. Most of the metabolic pathways are not regulated
   d. Metabolic regulation does not depend on control by hormones

2. What is the name of the molecule that the cell uses to directly control metabolic pathways?
   a. Enzyme
   b. Substrate
   c. Product
   d. ATP

3. Which of the following cycle shows amphibolic pathway?
   a. Citric acid cycle
   b. Glyoxylate
   c. Glycolysis
   d. Lipid metabolism

4. The body's central metabolic clearing house is:
   a. Adipose tissue
   b. Brain
   c. Skeletal muscle
   d. Liver

5. When two reactions are connected through a common intermediate, they are said to be:
   a. Regulated
   b. Inhibited
   c. Coupled
   d. Compartmentalized

6. Pyruvate is the precursor of:
   a. Alanine
   b. Glutamate
   c. Serine
   d. Proline

7. Which of the following gives rise to methionine, threonine and lysine?
   a. Pyruvate
   b. Aspartate
   c. Glutamate
   d. Serine

8. Which of the following is a non-essential amino acid?
   a. Lysine
   b. Leucine
   c. Serine
   d. Methionine

9. In which form the nitrogen is incorporated into an amino acid?
   a. Nitrite
   b. Glutamate
   c. Nitrate
   d. Ammonium ion

10. The carbon skeleton of glycogenic amino acids is finally degraded to:
    a. α-ketoglutarate
    b. Succinyl CoA
    c. Fumarate
    d. Any of the above

11. The EMP pathway in eukaryotes usually takes place in:
    a. Nucleus
    b. Lysosome
    c. Mitochondria
    d. Cytoplasm

12. The free fatty acids are transported by blood in association with:
    a. β-lipoprotein
    b. Albumin
    c. Globulin
    d. Hemoglobin

13. Electron transport system (ETS) is present in which of the following parts of mitochondria?
    a. Inner membrane
    b. Outer membrane
    c. Matrix
    d. Stroma

14. ATP synthesis by ATP synthase is driven by the movement of:
    a. Protons
    b. NADH
    c. Electrons
    d. All of the above

15. Glucose 6-phosphatase enzyme is present in:
    a. Cytoplasm
    b. Mitochondrial matrix
    c. Lysosome
    d. Endoplasmic reticulum

16. How many ATP is/are required for activation of fatty acid?
    a. 1
    b. 2
    c. 3
    d. 4

17. In Gluconeogenesis Glucose is produced from:
    a. Pyruvate
    b. Glycerol
    c. Glutamic acid
    d. All of them

18. Pentose Phosphate Pathway produces:
    a. Ribose sugar
    b. NADPH
    c. Both a & b
    d. None of these

19. Inhibitor of Electron Transport chain is/are:
    a. Cyanide
    b. Carbon Monoxide
    c. Both a & b
    d. None of these

20. 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]

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? 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 β-oxidation of Palmitic acid(C_{16}). 10

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