

**B.Sc. ZOOLOGY**  
**FOURTH SEMESTER**  
**BIOCHEMISTRY OF METABOLIC PROCESSES**  
**BSZ – 403**

( Use Separate Answer Scripts for Objective & Descriptive )

Duration : 3 hrs.

Full Marks : 70

( PART-A: Objective )

Time : 20 min.

Marks : 20

*Choose the correct answer from the following:*

*1X20=20*

- Select the correct group of chemical energy
  - Biotine, ATP, GTP, NADH
  - GTP, ATP, NADH, NADPH
  - DNA, ATP, RNA, FAD
  - All are correct
- Find out the energy poor end products of catabolism
  - Carbon dioxide
  - Water
  - Ammonia
  - All of these
- TCA cycle is a good example of
  - Anabolic pathway
  - Catabolic pathway
  - Amphibolic pathway
  - None of these
- Which one is true for catabolism?
  - Oxidative process
  - Reductive process
  - Endergonic process
  - None of these
- Which hormone regulates metabolism of glucose?
  - Insulin
  - Growth hormone
  - Prolactin
  - Oxytocin
- Which reaction is not found in citric acid cycle?
  - Condensation of Acetyl CoA with OAA
  - Isomerization of OAA
  - Hydration of Fumarate to Malate
  - Dehydrogenation of Malate to OAA
- The nucleotide that is essential for glycogenesis is
  - ATP
  - GTP
  - CTP
  - UTP
- Glycogenin is a protein in glycogenesis that serve as
  - Biocatalyst
  - Primer
  - Oxidizing agent
  - Reducing agent
- What is correct site of glycogenolysis?
  - Liver and Muscle
  - Liver and kidney
  - Muscle and Pancreas
  - Muscle and adipose tissue

10. A unit of how many sugars are separated by debranching enzyme at a time?  
a. 3  
b. 4  
c. 5  
d. 6
11. Hexose monophosphate shunt is also known as  
a. Pentose phosphate pathway  
b. Dickens-Horeker pathway  
c. Phosphogluconate pathway  
d. All of these
12. What is the name of the carbohydrate with seven carbon that is formed in HMP pathway  
a. Ribulose-5-Phosphate  
b. Xylose-5-phosphate  
c. Sedoheptulose-7-phosphate  
d. None of these
13. What is the net gain of energy (ATP) in beta oxidation?  
a. 112  
b. 121  
c. 129  
d. 132
14. What ions are needed in activation of fatty acids?  
a.  $\text{Na}^+$   
b.  $\text{Ca}^{++}$   
c.  $\text{Mg}^{++}$   
d.  $\text{Mn}^{++}$
15. Reactions of which process takes place in smooth endoplasmic reticulum?  
a. Gluconeogenesis  
b. Glycolysis  
c. Beta oxidation  
d. Omega oxidation
16. Which of the following is an odd chain fatty acid?  
a. Palmitic acid  
b. Lauric acid  
c. Pentadecanoic acid  
d. Linolenic acid
17. In which part of mitochondria electron transport chain occurs?  
a. Inner membrane  
b. Outer membrane  
c. Matrix  
d. Stroma
18. The product of glycolysis that is essential for oxidative phosphorylation is  
a. FAD and ATP  
b. NADH and FADH  
c. Acetyl CoA  
d. Pyruvate
19. Which one is non-essential amino acid?  
a. Alanine  
b. Asparagine  
c. Leucine  
d. Serine
20. All protein forming amino acids degrade to form  
a. Pyruvate  
b. Acetyl CoA  
c. Alpha ketoglutarate  
d. All of them

**( PART-B : Descriptive )**

Time : 2 hrs. 40 min.

Marks : 50

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

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| 1. Explain various steps of glycolytic pathway. Add a note on energy budget of glycolysis  | 8+2=10 |
| 2. What are different types of metabolic pathways? Explain how different metabolic pathways are controlled in the body?                          | 4+6=10 |
| 3. Write how glucose molecules are formed from various non-carbohydrate sources.   | 10     |
| 4. Explain different steps in oxidation of different odd chain fatty acids in the cell.  | 10     |
| 5. Mention the sites in ketogenesis in the body. Narrate different steps of ketogenesis.   | 2+8=10 |
| 6. Show the formation and utilization of an amino acid pool in the cell. Explain various catabolic reactions that break amino acids in the cell? | 4+6=10 |
| 7. Mention different sources from which amino acids are synthesized. Explain any two of these sources showing the reaction sequences.            | 3+7=10 |
| 8. Describe the reaction pathways that occur in mitochondrial respiratory chain  | 10     |

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