

1 (Sem-6/FYUGP) ZLG 63 MJ

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ZOOLOGY

(Major)

Paper : ZLG0600304

(**Biochemistry of Metabolic Processes
and Regulation**)

Full Marks : 45

Time : 2 hours

*The figures in the margin indicate full marks
for the questions.*

1. Choose the correct answer/Write True or False : 1×5=5
- (a) What is the substrate for the last step of glycolysis?
- (i) Glyceraldehyde 3-phosphate
 - (ii) Phosphoenolpyruvate
 - (iii) 1,3-bisphosphoglycerate
 - (iv) None of the above
- (b) β -oxidation of fatty acid occurs in
- (i) cytoplasm
 - (ii) nucleus
 - (iii) mitochondria
 - (iv) All of the above

(2)

- (c) Oxidative phase of pentose phosphate pathway is non-reversible phase.

(Write True or False)

- (d) From which toxic substance urea is formed?

- (i) Ammonia
- (ii) Uric acid
- (iii) Carbon dioxide
- (iv) None of the above

- (e) In which reaction of the Krebs' cycle FAD is reduced?

- (i) Isocitrate to oxaloacetate
- (ii) Succinyl-CoA to succinate
- (iii) Fumarate to malate
- (iv) Succinate to fumarate

2. Answer any *five* of the following in brief :

2×5=10

- (a) Define metabolism.
- (b) Why is ATP called the energy currency of the cell?
- (c) What are co-factors?
- (d) Why is TCA cycle called amphibolic pathway?
- (e) What is the significance of pentose phosphate pathway?

(3)

- (f) Define deamination.

- (g) Define substrate-level phosphorylation.

- (h) What is coupled reaction? State its significance.

- (i) What is redox reaction? How does redox reaction contribute in ATP production?

- (j) Define glycogenolysis.

3. Answer any *four* of the following : 5×4=20

- (a) What is gluconeogenesis? Briefly describe the metabolic reaction of gluconeogenesis. 1+4=5

- (b) Explain chemiosmotic hypothesis.

- (c) Describe the process of urea cycle.

- (d) Explain the process of glycogenesis and add a note on its regulation.

- (e) What is omega oxidation? Write about its significance.

- (f) Write a note on inhibitors of respiratory chain.

- (g) Explain the fate of C skeleton of glucogenic amino acid.

- (h) Describe schematically the process of ketogenesis.

4. Answer any *one* of the following : 10

- (a) Explain the process of β -oxidation of saturated fatty acid with even number of carbon atom. Give the energetics involved in the process. 7+3=10
- (b) Describe the process of glycolysis. Explain the regulatory steps of glycolysis and its energetics. 5+3+2=10
- (c) Describe the various components of electron transport chain with diagrammatic illustration of electron flow and ATP producing sites. 7+3=10
- (d) Describe the reactions of citric acid cycle. Explain the regulatory mechanism of citric acid cycle. 5+5=10

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