

[This question paper contains 4 printed pages.]

993

Your Roll No.

B.Sc. (Hons.) / II

C

BIOCHEMISTRY - Paper IX

Metabolism of Carbohydrate and Lipids

(Admissions of 2000 and onwards)

Time : 3 Hours

Maximum Marks : 60

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

*Attempt **Five** questions in all, including
Question No. 1 which is compulsory.*

1. Explain the following :

- (i) Why is glucose immediately phosphorylated inside the cell ?
- (ii) Isocitrate dehydrogenase catalyzes the first oxidative decarboxylation of enzyme TCA cycle.
- (iii) Glucokinase is inducible enzyme while hexokinase not.
- (iv) Triacyl glycerol synthesis in adipose tissue is dependent on glucose.

P.T.O.

(v) Pentose phosphate pathway provide reducing power for reductive biosynthesis.

(vi) Why has photorespiration survived the evolutionary forces inspite of the fact that it limits the growth of plants ?

(vii) How are fatty acids transported from the cytosol to mitochondria for oxidation ?

(viii) Anaplerotic reactions replenish the TCA cycle intermediates. (2×8=16)

2. (a) Write down the features of Hatch and Slack Pathway, bringing out the importance of compartmentation.

(b) How will the following molecule affect the rate of glycolysis ?

(i) Increased level of Fructose 2,6 bis phosphate

(ii) Increased level of Fructose 6 Phosphate

(iii) Decreased level of ATP

(iv) Increased level of Citrate

(v) Increased level of AMP

(c) Write down the synthesis of ceramide from pamiitoyl CoA and serine. (4,2½,4½)

3. Explain the reaction and regulation of the following enzymes

(i) Pyruvate Dehydrogenase

(ii) Rubisco Enzyme

(iii) Fatty Acid Synthetase (4,3,4)

4. (a) Write down the synthesis of ketone bodies. What is their physiological significance?

(b) What are anaplerotic reactions? Explain with example.

(c) ω -oxidation of fatty acids yield small amount of dicarboxylic acids. Explain.

(d) Differentiate between malate aspartate shuttle and glycerol 3 phosphate shuttle. (3.2.2.4)

5. (a) Match the following diseases to their respective enzymes

Disease

Von Gierke

Mc Ardle

Refsum

NieMann Pick

Fructose Intolerance

Enzymes

Type B Aldolase

Glycogen phosphorylase

Sphingomyelinase

α Oxidase

Glucose 6 phosphatase

(b) Explain why the leaves of some species of desert plants taste sour in early morning but as the day wear on, they become tasteless.

P.T.O.

- (c) Why is there no oxidation and reduction in anaerobic respiration? (5,2,4)
6. Compare the following :
- (i) β oxidation in mitochondria and peroxisomes
 - (ii) Glyoxalate and TCA cycle
 - (iii) Fructose catabolism in adipose tissue and liver (4,4,3)
7. (a) What will be the fate of Glucose 6 Phosphate under following condition. Explain :
- (i) Much more Ribose 5 Phosphate than NADPH is required
 - (ii) The need for NADPH and Ribose 5 phosphate is balanced
 - (iii) Much more NADPH than ribose 5 phosphate is required
- (b) How lactate produced in muscle is converted to glucose in liver. (9.2)
8. Write down short notes on any **three** of the following :
- (i) Multi enzyme complex
 - (ii) Galactose catabolism in mammals
 - (iii) Amphibolic role of TCA cycle
 - (iv) Role of lipoprotein in lipid transport
- (4.3½,3½)
(200)