0102E1288

Candidate's Seat No :_____

MSc Sem.-1 Examination

401

Life Science

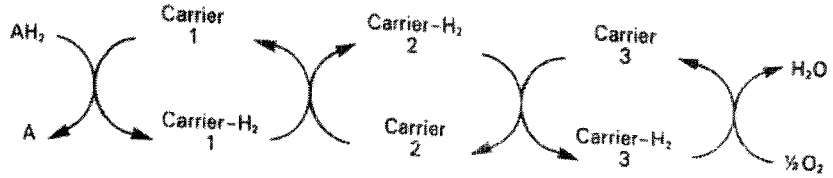
February-2025

Time : 2-30 Hours] **[Max. Marks : 70**

Instructions: Illustrate your answers with neat diagrams wherever necessary.

Que 1 Write the following

(i) What is redox potential? From the given equation, state the name of the enzymes and point out the oxidation and reduction steps of a metabolite in a respiratory chain. (7 Marks)



(ii) What is quinone? What is FMN center? State the electron transfer reaction from Co-Q to cytochrome C. (7 Marks)

OR

(i) What is complex III? Describe its function in the electron transport chain with a diagram. (7 Marks)

(ii) Explain chemo-osmotic model for ATP generation with a diagram. Write a short note on "superoxide free radical may account for oxygen toxicity". (7 Marks)

Que 2 Write the following

(i) What are Carbohydrates? Classify briefly with examples (7 Marks)

(ii) Write a short note on Compound lipids (7 Marks)

OR

(i) Describe in detail about Starch. What is the difference between Amylose and Amylopectin? (7 Marks)

(ii) Define Protein. What are the characteristics of peptide bond? What happens in protein conformation that leads to sickle cell disease? (7 Marks)

Que 3 Write the following

(i) What is Glycogenin? How does Glycogenin initiate glycogen synthesis? (7 Marks)

(ii) Discuss the hormonal regulation of gluconeogenesis when blood glucose level is low. (7 Marks)

OR

(i) Discuss the regulation of HMP shunt when cells require more NADPH then ATP. (7 Marks)

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(ii) How many ATP molecules are generated in a single glucose molecule catabolism? Discuss in brief with only energy formation steps. (7 Marks)

Que 4 Write the following

(i) Discuss the regulation of fatty acid synthesis and oxidation in high and low blood glucose levels. (7 Marks)

(ii) Give an account of β – oxidation of saturated even carbon fatty acid (Palmitic acid) along with its energetics and regulation. (7 Marks)

OR

(i) How many ATP molecules will be generated after completely oxidizing Lauric acid (C12) and heptadecanoic acid (C17) Fatty acids? (7 Marks)

(ii) What is the role of carnitine in fatty acid metabolism? Discuss with a proper diagram. (7 Marks)

Que 5 Attempt any seven out of twelve (14 Marks)

(i) What is the most common bonding orbital for carbon? When are carbons chiral and optically active?

(ii) What are the characteristics of glycogen?

(iii) What is produced when Glutamic acid is decarboxylated?

(iv) Give the clinical importance of ω- oxidation of fatty acid.

(v) Write the stages of Mitochondrial oxidation of fatty acids.

(vi) Write the key importance of Phosphorylated Intermediates in the glycolytic pathway.

(vii) Write the importance of Cori's cycle.

(viii) Who is the competitive inhibitor of carnitine acyl transferase-I?

(ix) Distinguish between saturated and unsaturated fatty acids with examples.

(x) What is the difference between equilibrium constant and dissociation constant?

(xi) Why can't G6PD-deficient patients be given G6PD injections in the same manner that Type 1 Diabetic can be treated using insulin injections?

(xii) Write the metabolic significance of the TCA cycle.