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SARDAR PATEL UNIVERSITY
 T.Y.B.Sc EXAMINATION, VIth Semester
 Saturday, 25th June 2022, 10.00 a.m to 12.00 p.m
 BIOTECHNOLOGY: US06CBIT23 [Metabolism]



Maximum Marks-70

NOTE- Figures in the right indicate full marks.

Q.1. Multiple Choice Questions (10 marks- One Mark for Each MCQ)

1. Products of glucose oxidation essential for oxidative phosphorylation are _____
 a) Pyruvate b) Acetyl co-A c) NADPH and ATP d) NADH and FADH₂

2. What factor determines the binding of carbon dioxide to the active site of RuBisCO?
 a) Intensity of sunlight b) Opening and closing of stomata
 c) Number of chloroplasts d) Relative O₂ and CO₂ concentration

3. In the glucose-alanine cycle
 a) export alanine to the liver, c) receive glucose from the liver
 b) Alanine diffuses into the bloodstream and reaches the liver d) All the above

4. Conversion of xylulose 5-phosphate to ribulose 5-phosphate is catalyzed by _____
 a) Phosphopentose epimerase b) Transaldolase
 c) Transketolase d) Phosphopentose isomerase

5. Which of the following enzyme is responsible for glycogen breakdown?
 a) Glycogen phosphorylase b) Glycogen phosphatase
 c) Glycogen hydrolase d) Glycogen phosphoglycosidase

6. Which of the following carries acyl groups in thio-ester linkage?
 a) Acyl carrier protein b) Acetyl co-A ACP transacetylase
 c) Enoyl-ACP reductase d) Malonyl co-A ACP transferase

7. What is the role of L-carnitine in fatty acid metabolism?
 a) Activator of acetyl CoA carboxylase
 b) Serve as a cofactor for enzyme fatty acid synthase
 c) Facilitate the transport of fatty acid from the cytosol to mitochondria
 d) None of the above

8. Which of the following reduces double bond, forming saturated acyl ACP?
 a) β -ketoacyl ACP reductase b) β -hydroxyacyl ACP dehydratase
 c) Enoyl ACP reductase d) Malonyl co-A ACP transferase

9. The nitrogens of a purine molecule are derived from all of the following amino acids:
 a) Aspartic Acid and Glutamine b) Asparagine and Glutamine
 c) Glutamate and Alanine d) Glycine and Alanine

10. Which of the following cofactor is used during the conversion of uracil to thymine?
 a) S-Adenosyl Methionin b) Tetrahydrofolate
 c) Tetrahydrobiopterin d) Biotin

Q.2. Fill in the blanks/ True and False (8 Marks- One Mark Each)

1. In which type of reactions related to plant photosynthesis peroxisomes are involved _____
2. Alpha amylase is the most abundant enzyme in the world..(True/False)
3. The enzyme is responsible for the addition of UDP-Glucose to the existing chain _____
4. The transport of pyruvate into the mitochondria is via the transport protein pyruvate translocase.(True/False)
5. The enzyme _____ transacetylase transfers malonyl group from CoA to ACP.
6. Acyl protein carrier containing the prosthetic group 4'-phosphopantetheine. (True/False)
7. _____ serves as the cofactor for the denovo synthesis of purine metabolism
8. Urea cycle converts amino acids into keto acids. (True/False)

Q.3. Short Question (any 10 question x 2 marks each)

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1. Write four differences between C₃ and C₄ plants.
2. Discuss about the RUBISCO enzyme.
3. Write about Peter Mitchell's chemiosmotic hypothesis.
4. Discuss with diagram about Glyceraldehyde-3-phosphate dehydrogenase shuttle.
5. Describe about the bypass of gluconeogenesis pathway.
6. Discuss about the non-oxidative pentose phosphate pathway.
7. Discuss with diagram about FAS complex enzyme.
8. Describe about the ketogenesis pathway.
9. Discuss about the role of carnitine in beta oxidation of fatty acids.
10. Discuss difference about the enteropeptidase and carboxypeptidase.
11. Describe the deamination reaction of amino acid.
12. Discuss the Cahill cycle with its significance.

Q.4. Long Answer Question (attempt any 4 X 08 marks each)

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1. Describe with equation about the complex-I of oxidative phosphorylation.
2. Discuss about the ATP synthase enzyme with diagram.
3. Draw the TCA cycle with its ATP production.
4. Describe the oxidative pentose phosphate pathway with neat diagram.
5. Discuss the beta oxidation of Palmitic acids.
6. Describe the pathway alpha oxidation fatty acid.
7. Describe the de novo pathway for the biosynthesis of Inosine Mono Phosphate.
8. Discuss about the Urea Cycle with its significance.

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