

- N.B.: (i) Answers of all the questions (including multiple choice questions) should be written in the provided answer book only.
(ii) Figures in the right indicate marks.

Q1. Choose the most appropriate answer for the following multiple choice questions: (8)

- Phosphoglycerate kinase in glycolysis produces ATP via
 - Oxidative phosphorylation
 - Oxidative decarboxylation
 - Substrate level phosphorylation
 - Phosphorylation
- The energy released by the breakage of thioester bond of succinyl-CoA in citric acid cycle is used to synthesize
 - a phosphoanhydride bond in GTP
 - a thioester bond in Acetyl-CoA
 - an ester bond in fatty acyl-CoA
 - the primary metabolite
- Reduction of $\frac{1}{2}$ O₂ molecule to H₂O by electrons transferred from complex I of ETC produces _____ ATP molecules
 - 1
 - 2
 - 2.5
 - 1.5
- Biosynthesis of ketone bodies is favoured in cells under _____ conditions.
 - hypoglycemic
 - diabetic
 - starvation
 - all of the above
- When the activity of Phosphofructo kinase-1 is reduced?
 - When ATP concentration is low
 - When ATP concentration is high
 - When Citrate and ATP both are in low concentration
 - It has nothing to do with ATP concentration
- The precursor to glycogen in the glycogen synthase reaction is
 - Glucose 1- phosphate
 - UDP-glucose
 - Glucose -6- phosphate
 - None of the above
- Which of the following is a common compound shared by the TCA cycle and the urea cycle.
 - α -ketoglutarate
 - succinyl coA
 - Oxaloacetate
 - fumarate
- Which out of following amino acids is not required for Glutathione biosynthesis.
 - Cysteine
 - Glutamic acid
 - Serine
 - Glycine

Q2. Answer any SEVEN of the following questions briefly:

(7 X 2 = 14 Marks)

1. Differentiate between free energy change and standard free energy change.
2. Differentiate between Glucokinase and Hexokinase.
3. Differentiate between PFK-1 and PFK-2.
4. Which biomolecule is the major source of energy for hepatocytes during normal metabolism? Why?
5. What is the importance of PEP carboxykinase in metabolism?
6. What are anaploretic reactions? Give examples.
7. An amino acid that yields acetoacetyl-CoA during catabolism is glucogenic or ketogenic?
8. In which cells glucose -6- phosphatase enzyme is found? What is its subcellular location?
9. Name the amino acid sequence of peptide AFDQCTWYR

Q3. (a) Explain the regulation of glycolysis. (6)

(b) Explain the different fates of pyruvate in the cell. Also explain the conditions during which these fates are preferred. (6)

OR

(b) List the tissue where Pentose Phosphate pathway is found active and explain the reactions and importance of this pathway. (6)

Q 4. (a) What are ketone bodies? Under which physiological conditions are they produced? (6)

(b) Explain the oxidation of Myristoyl-coA and calculate the energy production by β - oxidation. (6)

OR

(b) Explain the reactions and importance of ω -oxidation. (6)

Q .5 (a) Give any two examples and explain transamination reactions. (6)

(b) Explain the regulation of the urea cycle. (6)

OR

(b) Explain the reactions for conversion of glycine to serine. (6)

Q.6 (a) Explain the regulation of purine nucleotide biosynthesis. (6)

(b) Write a denovo purine biosynthesis pathway. (6)

OR

(b) What is salvage pathway? Give the salvage pathway for pyrimidine biosynthesis. (6)

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