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SARDAR PATEL UNIVERSITY
M. Sc. (I Semester) (under CBCS) Examination
Wednesday, 6th April 2016
Time: 10.30 a.m to 1.30 p.m.
Paper: PS 01 C BIC03 (Cellular Metabolism)

Total Marks: 70

Q1. Give the correct answers for the following questions: (08)

1. Phosphoglycerate kinase in glycolysis produces ATP via
   (a) Oxidative phosphorylation (b) Oxidative decarboxylation
   (c) Substrate level phosphorylation (d) Phosphorylation

2. Mitochondrial Oxidation and phosphorylation are
   (a) Separate reactions (b) coupled reactions
   (c) depends on cells' energetic status (d) none

3. In the reversible reaction A → B, in which direction reaction will proceed if the concentration of A is increased?
   (a) Depends on std. free energy (b) depends on free energy (c) forward (d) reverse

4. Glycolysis proceeds fastest in
   (a) myocyte (b) a starved cell
   (c) cardiac cells (d) cancerous cells

5. Reduction of ½ O2 molecule to H2O by electrons transferred from complex I of ETC produces _____ ATP molecules
   (a) 1 (b) 2
   (c) 2.5 (d) 1.5

6. Biosynthesis of ketone bodies is favoured in cells under _____ conditions.
   (a) hypoglycemic (b) diabetic (c) starvation (d) all of the above

7. Glutamine is synthesized in the liver by the action of enzyme
   (a) Transaminase (b) α- ketoglutarate dehydrogenase
   (c) Glutamine synthetase (d) none of the above

8. Citrate is broken down into cell cytosol to Acetyl-coA and oxaloacetate by
   (a) Citrate hydratase (b) Citrate lyase
   (c) Citrate is not broken down in cytosol (d) Citratase

Q.2 Answer **any seven** of the following questions briefly: (14)

1. Name the regulatory enzymes of glycolysis.
2. What is the importance of PEP carboxykinase in metabolism?
3. What are anaploretic reactions? Give examples.
4. Differentiate between PFK-1 and PFK-2.
5. What are essential fatty acids? Give examples.
6. Differentiate between Glycogen synthase and Glycogen phosphorylase
7. Differentiate between ß-oxidation in mitochondrial matrix and ß- oxidation in peroxisomes.
8. Why glutamate, and glutamine are found in higher concentration in blood compared to other amino acids?
9. Name the amino acid sequence of peptide ADPFQCTWYRG

Q.3 (a) Explain: Biological energy transformations obey the laws of thermodynamics. (06)

(b) Explain the different fates of pyruvate in the cell. Also explain the conditions during which these fates are preferred. (06)

OR

Q.3 (b) Explain the site, reactions and importance of pentose phosphate pathway (PPP). (06)

Q.4 (a) What are redox reactions? List various types of redox reactions occurring in a cell. (06)

(b) Explain the mechanism of action of ATP synthase in detail. (06)

OR

Q.4 (b) Explain the regulatory enzymes of TCA cycle. (06)

Q.5 (a) What are ketone bodies? Under which physiological conditions are they produced? (06)

(b) What is salvage pathway? Give the salvage pathway for pyrimidine biosynthesis. (06)

Q.5 (b) Explain the regulation of the urea cycle. (06)

Q.6 (a) Give examples and explain transamination reactions. (06)

(b) Explain the regulation of purine nucleotide biosynthesis. (06)

OR

Q.6 (b) Explain - intermediary metabolism. (06)