

Note: Answer to all questions (including multiple choice questions) should be written in the provided answer book only.

Number of Printed Pages = 2

(51)

SARDAR PATEL UNIVERSITY  
M.Sc (I Semester) Examination (CBCS)  
Thursday, 6<sup>th</sup> December, 2012  
10:30 am to 1:30 pm  
Biotechnology  
PS01EBIT01 – Biochemistry

TOTAL MARKS: 70

Q.1 Tick mark / select the correct answer for the following. (Only correct option against given question number needs to be written in provided answer book) (08 Marks)

- 1) Most of the glucose units in glycogen are linked by:
  - a)  $\alpha$  - 1,4 - glycosidic bonds
  - b)  $\alpha$  - 1,6 - glycosidic bonds
  - c)  $\beta$  - 1,4 - glycosidic bonds
  - d)  $\beta$  - 1,6 - glycosidic bonds
  
- 2) Pyruvate  $\xrightarrow{?}$  Acetaldehyde  $\xrightarrow{?}$  Ethanol:  
One of the following is the correct order of enzymes in the above reaction
  - a) Pyruvate decarboxylase, Alcohol dehydrogenase
  - b) Alcohol dehydrogenase, Pyruvate decarboxylase
  - c) Pyruvate decarboxylase, Aldehyde dehydrogenase
  - d) Pyruvate decarboxylase, Aldehyde succinase
  
- 3) The following statement best describes the link between glycolysis and TCA cycle
  - a) Oxidative decarboxylation of pyruvate to form acetyl CoA
  - b) Formation of oxaloacetate from Malate
  - c) Reduction of pyruvate by NADH to form lactate
  - d) Formation of pyruvate from phosphoenol pyruvate
  
- 4) Oxidation of which substance in the body yields the most calories
  - a) Lipid
  - b) Glucose
  - c) Glycogen
  - d) Protein
  
- 5) Acetyl coA can be directly converted to all except
  - a) Fatty acids
  - b) Cholesterol
  - c) Ketone bodies
  - d) Glucose
  
- 6) Glycolytic pathway regulation involves:
  - a) allosteric stimulation by ADP
  - b) allosteric inhibition by ATP
  - c) feedback, or product, inhibition by ATP
  - d) all of the above
  
- 7) Which of the following amino acids is considered as both ketogenic and glucogenic?
  - a) Valine
  - b) Phenyl alanine
  - c) Lysine
  - d) Tryptophan
  
- 8) Sucrose is not
  - a) Cane sugar
  - b) Table sugar
  - c) Invert sugar
  - d) Reducing sugar

- Q.2 Answer any seven from the following: (14 mark)**
- a) Differentiate between glucogenic and ketogenic amino acid
  - b) How much energy is produced by oxidation of one glucose molecule by glycolysis under anaerobic conditions?
  - c) Which are the four types of electron transfers involved in biological system?
  - d) Why muscle and brain tissues cannot carry out gluconeogenesis?
  - e) Differentiate between hexokinase and glucokinase.
  - f) Explain: Extrahepatic tissues use ketone bodies as fuels?
  - g) Distinguish between Denovo and Salvage pathways
  - h) What are anaploratic reactions? Give examples.
  - i) How Acetyl-coA comes to cytoplasm for FA biosynthesis?

**Q.3 A: Explain the site, reactions and importance of pentose phosphate pathway (PPP). (6 marks)**

**Q.3 B: Explain the coordinated regulation of glycolysis and gluconeogenesis? (6 marks)**

**OR**

**Q.3 B: Explain the fate of pyruvate in aerobic and anaerobic conditions (6 marks)**

**Q.4 A: Describe the structure, function and mechanism of ATP synthase complex (6 marks)**

**Q.4 B: Explain: "The free energy changes of a reaction is independent of the pathway by which the reaction occurs, it is only that the reaction proceeds from high energy status to the lower energy status". (6 marks)**

**OR**

**Q.4 B: Write short note on Q-cycle (6 marks)**

**Q.5 A: Write a brief note on  $\beta$ -oxidation of saturated fatty acid (6 marks)**

**Q.5 B: What are ketone bodies? How are they formed inside the body (6 marks)**

**OR**

**Q.5 B: Narrate the process of digestion, metabolism and transport of fats. (6 marks)**

**Q.6 A: Explain biosynthesis of Chorismate and explain biosynthesis of one amino acid from Chorismate. (6 marks)**

**Q.6 B: Explain the structure and function of glutathione (6 marks)**

**OR**

**Q.6 B: What do you understand by the term "inborn metabolic errors"? Explain the cause, symptoms and treatment of any two of them (6 marks)**

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