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[A-88]

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SARDAR PATEL UNIVERSITY  
B.Sc.(6<sup>th</sup> Semester) EXAMINATION 2016  
Friday, April 1<sup>st</sup>, 2016  
2:30 p.m. TO 5:30 p.m.  
SUBJECT: MICROBIOLOGY US06CMIC03  
(Microbial Biochemistry)

TOTAL MARKS: 70

- Note: (1) All the questions are compulsory.  
(2) Figures on the right indicate marks.

Q-I Select the correct answer for each question from the option given below [10]

1. Phosphoglycerate kinase in carbohydrate metabolism produces ATP via \_\_\_\_\_.  
(A) Oxidative phosphorylation (B) Substrate level phosphorylation  
(C) Oxidative decarboxylation (D) Oxidative deamination
2. Which of the following component of Electron Transport chain carries electrons from complex III to complex-IV?  
(A) Ubiquinone (B) Nicotinamide coenzyme  
(C) Cytochrome C (D) Flavoproteins
3. The calvin cycle begins by the attachment of CO<sub>2</sub> to which of the following compound?  
(A) 3 phospho glycerate (B) Ribulose 1,5 bis phosphate  
(C) Glucose (D) Xylulose-5-phosphate
4. Pyruvate the end product of glycolysis enters the citric acid cycle after it has been converted to \_\_\_\_\_.  
(a) Lactic acid (b) Acetyl CoA (c) Acetic acid (d) None of these
5. Which of the following compound inhibits β-oxidation of fatty acids?  
(A) Malonyl CoA (B) Acetyl CoA (C) NADPH (D) None
6. How many ATPs are yielded on complete oxidation of one molecule of palmitic acid?  
(A) 180 (B) 108 (C) 119 (D) 131
7. Which of the following is one of the precursors for aromatic amino acids?  
(A) Phospho enol pyruvate (B) Acetyl CoA (C) Glycine (D) Succinyl CoA
8. In urea cycle one amino group is derived from ammonia while second amino group is derived from which of the following amino acid?  
(A) Glutamic acid (B) Aspartic acid (C) Lysine (D) Arginine
9. Which of the following carrier allows migration of monomers through the cytoplasmic membrane during murine synthesis?  
(A) Folate (B) Pyridoxine (C) Carnitine (D) Undecaprenol
10. Which of the following subunit of ATP synthase is involved in ATP synthesis?  
(A) α (B) β (C) γ (D) e

**Q-2 Give Short answers to following questions (Any ten) [20]**

- [1] Draw the structure of ATP and enlist its significance in energy metabolism.
- [2] How pulse labeling technique can be useful to study intermediary metabolism?
- [3] Define photophosphorylation. Sketch the mechanism of photophosphorylation in purple sulphur bacteria.
- [4] Gluconeogenesis is energetically expensive but essential-Justify.
- [5] Give name of three enzymes and five coenzymes required by Pyruvate Dehydrogenase Complex.
- [6] Give two reactions of glyoxalate pathway which are unique.
- [7] Enlist the basic steps involved in the synthesis of fatty acids.
- [8] Define  $\alpha$  and  $\omega$  oxidation of fatty acids.
- [9] Which are three protein components of the acetyl co A carboxylase multienzyme complex?
- [10] Depict the reactions involve in the anaerobic dissimilation of aminoacids.
- [11] Sketch the pathway for Urea Cycle .
- [12] Give differences between transamination and deamination reactions.

Q-3 (A) Explain with suitable example –Use of biochemical mutants is a useful strategy to study intermediary metabolism. [04]

(B) Draw neat and labeled diagram of FoF1 ATPase and explain the rotational catalysis mechanism for ATP synthesis. [06]

Q-3 Enlist different components of Electron Transport Chain (ETC) and discuss the mechanism of electron transfer through different complexes. [10]

Q-4 (A) Write a note on- Non oxidative branch of pentose phosphate pathway. [05]

(B) Discuss regulation of glycolysis with reactions. [05]

Q-4 Explain Tricarboxylic acid cycle in detail with its regulation and energy generation. [10]

Q-5 (A) Write a note on-  $\omega$  oxidation of fatty acids [03]

(B) Discuss the anaerobic pathway for the biosynthesis of monounsaturated fatty acids in *E.coli*. [07]

**OR**

Q-5 Explain in detail all the enzymatic biochemical reaction involved in  $\beta$ -oxidation of palmitic acid with its energetics. [10]

Q-6 Discuss biosynthesis of aminoacids belong to aspartate family [10]

**OR**

Q-6 Discuss Murine synthesis in detail. [10]

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