Seat No.: _____ No. of printed pages: 3

SARDAR PATEL UNIVERSITY
B. Sc. (V Semester) Examination
Saturday, 26th December-2020
02.00 p.m. – 04.00 p.m.
US05CMIC22 : Microbial Metabolism

Total Marks : 70

Q:1 Select appropriate answer [10]

1. "Entropy of the universe increases during all chemical and physical reactions/processes" is ..

   a) is first law of thermodynamics b) second law of thermodynamics

   c) combination of first and second law of thermodynamics d)Newton's law

2. ..... in ETC contains NAD dehydrogenase with 6 non heme iron proteins
   a) complex I b) complex II c) complex III d) complex V
3. .....was awarded Nobel prize for his contribution in giving understanding of biological energy production through chemi osomosis theory .

   a) Paul Bouyer b) Peter Mitchell c)Michaelis Menten d) H.Buchner

4. Enzyme acts on only one isomer e.g: L- amino acid oxidase and D- amino oxidase is known as .....
   a)Reaction specificity b)Substrate specificity
   c) Steriospecificity d) all of these
5. Pick out the substrate level phosphorylation reactions:

   a)1,3 bis PGA to 3PGA b) 3-PGAL to 1,3-bis PGA c) PEP to pyruvate d) both A and C

6. Temperature coefficient is defined as increase in enzyme velocity when the temperature is increased by 10'C. and is also represented by .....

   a) E10 b) Q10 c) 1.1.1.10 d) T10

7. Isocitrate dehydrogenase, citrate synthase and alpha keto gluterate dehydrogenase are .....
   a) regulatory enzymes of TCA b) regulatory enzymes of HMP
   c) regulatory enzymes of EMP pathway
   d) inhibited by Glucose
8. Alpha oxidation of fatty acid occurs in fatty acids having CH3 gr.
   a) at β carbon b) at α carbon c) At ω carbon d) as a branch
9. ..... is the unique enzyme of Calvin Benson cycle
   a) RUBiSCO b) Pyruvate dehydrogenase c) Pyruvate Carboxylase
   d) Iso citrate Lyase
10. N-acetyl glucosamine and N-acetyl muramic acid are polymerized by_____ glycosidic linkage in peptidoglycan

    a) $\beta - 1,4$ b) $\alpha - 1,6$ c) $\alpha - 1,4$ d) $\beta - 1,6$

Q:2 A) **Fill in the blank:** [04]

1. .....involves 2 enzymes EI and EII , HPr and Phosphoenol pyruvate .
2. EC number of Oxidoreductases according to IUB is .....
3. .....require Pyridoxal Phosphat (PLP) – a coenzyme derived from vitaminB6
4. .....is the reaction in which organic molecule is the electron donor and other organic molecule is electron acceptor to produce ATP by substrate level phosphorylation .

B) Mark it as true or False [04]

1. F0 F1 subunit of ATPase enzyme has 9 subunits $3\alpha 3\beta\ \gamma\delta\varepsilon$.
2. Induced-fit model of enzyme action is more consistent with a wider range of enzymes & describe the situation more accurately and it was given by Fischer.
3. 2KDPG is the unique intermediate of EMP pathway for glucose catabolism.
4. Homoserine is the intermediate produced during bio synthesis of threonine, and methionine

Q:3 **Answer in brief: (any ten)** [20]

1. Draw cyclic photophosphorylation and mention its product(s).
2. Draw figures for uniport, and symport with its definition in one line .
3. Draw labeled biochemical structure of ATP and mention energy content in it.
4. Define: Constitutive Enzymes.
5. Draw labeled graphs of reversible types of enzyme inhibition.
6. Explain in brief sequential and concerted type of enzyme inhibition .
7. Draw Glyoxylate by pass cycle mentioning intermediates only.
8. Write Stickland reaction steps along with energy production stage
9. Mention any two salient features of transaminases.
10. Explain in brief: Radio isotope tracer technique
11. What is ACP? Mention the step(s) for incorporation of ACP in the reaction.
12. Define : Protrophs and auxotroph

Q:4 **Answer any four:** [32]

1. Draw bacterial ETC and explain PMF generation and theory of ATP production
2. Explain group translocation.
3. Explain enzyme specificity.
4. Explain allosteric enzyme regulation.
5. Explain TCA cycle as an amphibolic cycle.
6. Explain β oxidation of fatty acid and its energetic.
7. Explain Calvin Benson cycle .
8. Explain biosynthesis of amino acids of Aspartate family.