

[74/A-4]

Date: 06/10/2025

US05 CMIC52 Microbial Metabolism

Marks: 70

Time: 10:00 AM to 1:00 PM

No. of Printed Pages : 2



10

Q:1 Select appropriate answer:

1. .... gave Chemiosmosis theory.  
a) Paul Bouyer b) Peter Mitchell c) Changaux d) J.Sumner
2.  $E_o'$  value of  $\text{NAD}^+ + 2\text{H}^+ + 2e^- \longrightarrow \text{NADH} + \text{H}^+$  is ...  
a) -0.32v b) -0.22 v c) 0.32 v d) 0.82v
3. .... is an example of inhibitor of Electron transfer in ETC.  
a) Streptomycin b)  $\text{NO}_2$  c) Cyanide d) a and c
4. It is the number of substrate molecule converted into product by an enzyme in a unit time when the enzyme is fully saturated with substrate.  
a)  $K_{cat}$  b)  $k_m$  c)  $k_{0.5}$  d)  $pK$
5. Allosteric enzyme regulation is.....  
a) covalent reversible b) non covalent reversible  
c) irreversible d) none of these
6. Multiple forms of enzymes catalyzing same reactions are known as .....  
a) ribozymes b) isozymes c) coenzymes d) holoenzymes
7. 2KDPG is the unique intermediate of .....  
a) Gluconeogenesis b) ED pathway  
c) amino acid biosynthesis d) HMP pathway
8. .... oxidation is the oxidation of fatty acid with  $-\text{CH}_3$  gr. at  $\beta$  carbon.  
a)  $\omega$  b)  $\alpha$  c)  $\beta$  d) none of these
9. .... is not able to synthesize particular nutrient factor and require it as nutrient externally.  
a) Prototroph strain b) Auxotroph strain c) both a and b d) Chemotroph
10. ACP is .....  
a) 10,000 in mol wt. b) is required for Fatty acid biosynthesis  
c) contains pantotheinic acid d) all of these



Q:2 Answer any ten:

20

1. Draw the structure of ATP.
2. Write at least two differences between: cyclic and noncyclic-photophosphorylation.
3. Write role of Inhibitors and uncouplers of ETC and give an example of each.
4. Define:  $k_m$  and  $k_{0.5}$

[P. T. O.]

5. Explain briefly: Ping Pong reaction.
6. Draw labeled hyperbolic curve indicating first order, zero order reaction of enzyme substrate reaction on the graph.
7. Enlist precursors generated by EMP pathway.
8. Mention energetics of  $\beta$  oxidation of Palmitic acid.
9. Explain the role of Carnitine in Beta oxidation of fatty acid.
10. Explain in brief: Pulse labeling technique for elucidation of biochemical pathway.
11. Mention names of enzymes that are unique in Gluconeogenesis and are not common with EMP.
12. Mention the phases and stoichiometry of Calvin Benson cycle.
- Q:3 Explain ATP synthase enzyme and rotational catalysis theory. 10
- OR
- Q:3 Explain ETC and PMF generation. 10
- Q:4 a) Explain enzyme regulation by covalent modification. 05
- Q:4 b) Explain feedback inhibition and its types 05
- OR
- Q:4 Explain enzyme inhibition with graphs. 10
- Q:5 Explain TCA cycle. 10
- OR
- Q:5 Explain transamination and deamination of amino acids. 10
- Q:6 Explain aromatic amino acid biosynthesis. 10
- OR
- Q:6 Explain Peptidoglycan biosynthesis. 10

