QP Code : 77119

(2½ Hours) Total marks :75

N.B. (1) Attempt **all** questions.
(2) **Do not** write any explanation for labeled diagram and schematic representation questions.

Q. 1. A. Answer the following (**Attempt any two**) **10 marks**

1. Compare (one point) and differentiate (four points) between Facilitated diffusion and group translocation.
2. Write a short note on secondary active transport.
3. Draw a neat labelled diagram of maltose transport in *E coli.*
4. Draw and discuss assembly of proteins into membrane and protein export.

B. Do as directed (**Attempt any five**) **5 marks**

1. Define Proteoliposomes.
2. Define shock sensitive proteins.
3. Define passive diffusion.
4. Give two examples of siderophores.
5. Define Porin.
6. Give two examples of analogues used to study solute transport.
7. Name the scientist who devised a method for making membrane vesicles.
8. Define HPr.
9. Name the method used to isolate binding proteins in gram negative bacteria.
10. Name the membrane bound protein involved in nutrient transport.

Q. 2. A. Answer the following (**Attempt any Two**) **10 marks**

1. Write a short note on bacterial ATP synthase.
2. Enlist the four carriers of ETC and discuss the role of Quinones in ETC.
3. Draw a neat labelled diagram showing ATP synthesis by rotational catalysis.
4. Using a balance sheet calculate the number of moles of ATP formed during the complete oxidation of acetyl CoA to CO_2 and H_2O.

B. Do as directed (**Attempt any five**) **5 marks**

1. Give two examples of bioluminescent bacteria.
2. Define uncoupler.
3. Give two examples of inhibitors of ATP synthase.
4. Give two examples of mechanisms to generate electrochemical energy.
5. Give two examples of terminal oxidases in bacterial ETC.
6. Define Proton gradient.
7. Name the enzyme involved in light emission in bacteria.
8. Give two examples of enzymes involved in ammonia oxidation in *Nitrosomonas.*
9. Name the ultimate electron acceptor for anaerobic ETC.
10. Give two examples of dehydrogenases donating electrons into bacterial ETC.

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Q.3. A. Answer the following (**Attempt any Two**) 10 marks

1. Discuss use of biochemical mutants to study metabolism.
2. Discuss the breakdown of glycogen.
3. With chemical structures and enzymes write down the conversion of citric acid to succinic acid through TCA cycle.
4. Schematically represent non oxidative phase of HMP pathway.

B. Do as directed (**Attempt any five**) 5 marks

1. Give the reaction catalyzed by fumarate reductase (word reaction only).
2. Give two examples of organisms following ED pathway.
3. Name the enzyme converting xylulose-5-PO_4 to acetyl PO_4 and glyceraldehyde-3-PO_4.
4. Give the structure of 1,3-bisphosphoglyceric acid.
5. Name the products of isocitrate lyase activity.
6. Give the reaction catalyzed by pyruvate carboxylase (word reaction only).
7. Give structure of 6-phosphogluconic acid.
8. Give two examples of Homolactic fermenters.
9. Define maltose phosphorylase.
10. Name the enzyme of TCA cycle that is absent in anaerobic bacteria.

Q.4. A. Answer the following (**Attempt any Two**) 10 marks

1. Schematically represent reactions of peptidoglycan biosynthesis occurring in cytoplasm (word equations only).
2. With structures and enzymes write the formation of acetone and butanol from pyruvate by *Clostridium acetobutylicum*.
3. Schematically represent amphibolic role of TCA.
4. With structures and enzymes write the conversion of glucose to ethanol by yeasts.

B. Do as directed (**Attempt any five**) 5 marks

1. Define Bactoprenol.
2. Write the reaction catalysed by pyruvate formate lyase (word equation only).
3. Name the organism carrying out propionic acid fermentation.
4. Name the enzyme converting acetoin to 2, 3 butanediol.
5. Give two examples of organisms carrying out mixed acid fermentation.
6. What is transpeptidation?
7. Name two intermediates of butyrate fermentation.
8. Name two amino acids formed from 3-phophoglyceric acid.
9. Name the substrate preferred by propionic acid forming bacteria.
10. Name two enzymes involved in conversion of pyruvate to PEP in gluconeogenesis.

Q.5. Answer the following (**Attempt any Three**) 15 marks

1. Write a short note on PEP Phospho transferase system for transport of sugars in bacteria.
2. Write a short note on Bacteriorhodopsin.
3. Draw a neat labelled diagram of Mitochondrial ETC and discuss P:O ratio.
4. Write a short note on Sequential induction technique.
5. Discuss the five step reaction for converting pyruvate to acetyl CoA.
6. Schematically represent Heterolactic fermentative pathway (word equations only).

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