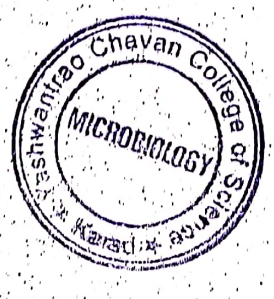
Shivaji University, Kolhapur
Yashwantrao Chavan College of Science Karad
Department of Microbiology
Class – M.Sc. I, Subject Name: MICROBIAL METABOLISM

State whether the given statements are TRUE or FALSE.

1. Proton motive force is the source of energy used to produce ATP in oxidative phosphorylation.
2. The conversion of glucose to two molecules of pyruvate is an exergonic process.
3. In TCA cycle, the reaction catalysed by enzyme succinate dehydrogenase gives one molecule of $FADH_2$ as a product.
4. It is not necessary that both oxidation and reduction should take place in the same redox reactions.
5. Succinyl CoA Synthetase is inhibited by fluoroacetate.
6. FMN; Fe-S are the functional component of complex I (NADH dehydrogenase).
7. Homolactic fermentation is the conversion of one glucose molecule into two lactic acid molecules.
8. Ethanol can act as an antidote by suppressing the metabolic production of toxicity from methanol.
9. Pyruvate dehydrogenase is a complex of enzyme responsible for conversion of pyruvate to fumarate.
10. Coenzyme Q alternatively known as ubiquinone is a benzoquinone derivative.
11. Low ATP concentration in the cell inhibits the phosphofructokinase enzyme involved in glycolysis.
12. Fatty acids synthesized from Acetyl Co A and NADPH in the mitochondrial matrix.
13. Oritidine monophosphate (OMP) the parent moiety for purine biosynthesis.
14. Citrate lyase action on Citrate take place in the matrix of mitochondria.
15. De novo synthesis of fatty acids occurs predominantly in liver, kidney, adipose tissue and lactating mammary glands.
16. Uncoupler molecules affect the ATP synthesis.
17. Shuttle system's principal mechanism is movement of NADH from cytoplasm to mitochondrial matrix.
18. Insulin and glucagon are polypeptide hormones synthesized and secreted by liver cells.
19. Heme is the prosthetic group for the cytochrome family of proteins.
20. Heterolactic fermentation is the conversion of one glucose molecule into the lactic acid molecule, carbon dioxide, and ethanol.
21. The conversion of glucose into glycogen is called glycogenolysis.



22. Inosine monophosphate (IMP) the parent moiety for pyrimidine biosynthesis.
23. The end product of purine metabolism in humans is uric acid.

Long Answer Question

1. Explain in brief metabolic control mechanism by enzyme activity and compartmentation. (16)
2. Describe in details the structure of mitochondria and components of ETC.
3. Describe in details proton motive force.
4. Provide a detailed explanation of TCA cycle
5. Describe in details enzymes, intermediates, cofactors & regulation of glycolysis.
6. Describe in details about De novo biosynthesis of purines.
7. Provide a detailed explanation of TCA cycle.
8. Describe in details about biosynthesis of fatty acids

Medium Answer question

1. Describe in details anaerobic respiration with suitable examples.
2. Describe in details hormonal regulation for metabolism.
3. Describe in details shuttle systems across the mitochondrial membrane.
4. Describe generation of membrane potential and its maintenance
5. Describe oxidative phosphorylation.
6. Explain metabolic control mechanism by compartmentation.
7. Metabolism of phospholipids.
8. β-oxidation of fatty acids.
9. Metabolism of glycogen.
10. Pyrimidine metabolism.
11. HMP pathway
12. Gluconeogenesis

Short answer question

1. High energetic compound -ATP
2. Nitrate as electron acceptor
3. Metabolism with an example
4. Redox potential.
5. Inhibitors of oxidative phosphorylation
6. ATP synthase
7. Malate Aspartate shuttle
8. Define catabolism & anabolism with an example
9. CO_2 as electron acceptors
10. Inhibitors of ETC
11. High energy compound -GTP
12. Methods employed to study the metabolism
13. Synthesis of triacyl glycerol
14. Inhibitors of nucleotide biosynthesis

15. Glyoxylate bypass
16. Catabolism of starch
17. Heterolactic, bacteria
18. Omega oxidation of fatty acids.
19. Clinical disorder of purine metabolism.
20. Omega oxidation of fatty acids.
21. Regulation of glycolysis.
22. Anabolism of starch.
23. Inhibitors of nucleotide biosynthesis.
24. Catabolism of glycogen