CARBOHYDRATE METABOLISM

Questions carry two marks:

1. Explain the entry of glycogen into glycolysis.
2. What are the reasons of phosphorylation of intermediates of glycolysis?
3. What is TCA cycle? Why TCA cycle is also known as kerb's cycle or citric acid cycle?
4. Write a substrate level phosphorylation reaction in TCA cycle.
5. Why TCA cycle is said to be amphibolic in nature?
6. State the energetics of TCA cycle.
7. State the metabolic role of HMP pathway.
8. Why is gluconeogenesis necessary for the body?
9. Name the rate limiting enzymes of gluconeogenesis.
10. Gluconeogenesis is not reversal of glycolysis. Justify the statement.
11. What is glycogenesis? explain the reactions.
12. How is glycogen metabolism regulated?
13. How does substrate level phosphorylation differ from oxidative phosphorylation?
14. What is diabetes mellitus? State the changes in carbohydrate,lipid and protein metabolism that occur in diabetes mellitus.
15. State important biochemical changes that occur in an uncontrolled diabetes mellitus.

Questions carry Four marks:

1. What is glycolysis? Mention the role of oxygen in glycolysis.
2. Name the steps of glycolysis where ATP is consumed.
3. Write the glycolytic reactions where ATP is produced.
4. What is substrate level phosphorylation? Write two reactions of substrate level phosphorylation in glycolytic pathway.
5. Explain the fate of pyruvate formed in glycolysis.
6. How many ATPs are formed in glycolysis in the presence of oxygen? Write the reactions.
7. What are rate limiting and key enzymes of glycolysis?
8. What is anaplerosis? Write anaplerotic reactions.
9. What is HMP pathway? How does HMP pathway differ from EMP pathway?
10. Write the reactions involved in oxidative phase of pentose phosphate pathway.
11. What is gluconeogenesis? Name the substrates of gluconeogenesis.
12. Write a note on CORI CYCLE.
13. What is glycogenolysis? Explain the activity of glycogen phosphorylase and debranching enzyme.
14. What are glycogen storage diseases?
15. Explain the autoregulation of blood sugar level.

LIPID METABOLISM

Questions carry two marks questions

1. What is β-oxidation? Who discovered it?
2. What is carnitine? Write its importance in β-oxidation.

3. How many acetyl CoA are produced from β-oxidation of one molecule of Palmitic acid.
4. Explain the effects of overproduction of Ketone bodies.
5. Write the structure of cholesterol and give it's importance.
6. What is ketosis?
7. Give the role of thiokinase in fatty acid oxidation.
8. Write a short note on regulation of cholesterol by hormones.
9. Give the significance of Fatty acid synthesis complex.
10. How are fatty acids activated.
11. What are essential fatty acids ? give an example.
12. Explain the formation of mevalonate from acetyl CoA during cholesterol synthesis.
13. Give the role of isomerases in the oxidation of unsaturated fatty acids.
14. What is the role of carnitine in fatty acid oxidation . Give its structure.
15. Prepare a list of materials required for biosynthesis of fattyacids.
16. Name the reductive steps in the biosynthesis of fattyacids which require NADPH .
17. What is the key and rate limiting enzyme in cholesterol biosynthesis.
18. What is atherosclerosis. What are the conditions for atheroscleris to occur.

Questions carry four marks questions

1. Delineate the steps of β-oxidation with reactions and enzymes.
2. Write the reactions of β-oxidation for saturated fattyacids with even and odd number of carbon atoms.
3. Mention the ketone bodies .How are they formed.
4. How are ketone bodies utilized in the human body.
5. How is palmitic acid biosynthesized.
6. How is fattyacid synthesis different from fatty acid oxidation.
7. Write short notes on (a) Fattyacid synthetase (b) Carnitine.
8. Write an outline for the biosynthesis of cholesterol .
9. How is biosynthesis of cholesterol regulated.
10. Mention the sources and fates of acetyl CoA in the body.
11. Outline the biosynthesis of fatty acids containing even number of carbon atoms.
12. Discuss the energetics of stearic acid degradation.
13. Discuss the structure and functions of fattyacid synthetase.
14. How are fattyacids activated and transported into mitochondria during β-oxidation.

NUCLEIC ACID METABOLISM

Questions carry two marks questions

1. Mention the biological importance of nucleotides?
2. How is PRPP formed? Give equation.
3. How is AMP/GMP formed from IMP?
4. What is orotic acid? How it is formed?
5. What is gout? Mention the features?
6. What is the normal uric acid level of blood?
7. How much uric acid is excreted daily in urine?

8. What is Allopurinol?
9. Explain ureotelism and ammoniatelism.
10. Give the sources of atoms for pyrimidine ring synthesis and purine ring synthesis.

Questions carry four marks questions

1. What are the sources of nitrogen and carbon atoms of purine and pyrimidine rings?
2. Prepare a list of materials required for purine and pyrimidine biosynthesis.
3. How is purine nucleotide biosynthesis regulated?
4. Write the reactions involved in purine nucleotide and pyrimidine nucleotide biosynthesis.
5. Discuss the regulation of pyrimidine biosynthesis.
6. How is XMP synthesized from ribose-5-phospate?

AMINO ACID METABOLISM

Question carrying two marks

1. Mention the three major reactions under amino acid metabolism.
2. Explain with a suitable example
a. Transamination
b. Deamination
c. Decarboxylation
3. Explain the steps of urea cycle occurring in mitochondria.
4. Give the significance of urea.
5. Name the two enzymes catalyzing the reactions of urea cycle in mitochondria.
6. Name the enzymes catalyzing the reactions of urea cycle in the cytosol.
7. How are the following amino acids synthesized
a. Glycine
b. Serine
c. Alanine
d. Aspertate
8. Explain the ureotelism and ammoniatelism.
9. Write the structure of epinephrine.
10. Give the biological importance of polyamines.
11. What are catecholamines? Give an example.
12. Explain the decarboxylation of histidine.
13. What is hypotammonia effect?
14. How is GABA biosynthesized?
15. What are Ketogenic amino acids? Give an example
16. How Histamine is synthesized?
17. What are polyamines? Give an example.

Questions carrying four marks

1. Explain the purpose of urea cycle and how is it regulated?
2. Outline the reactions of urea cycle occurring in the cytosol.
3. How is cysteine synthesized from methionine?
4. Outline the biosynthesis of epinephrine.

5. Explain the disorders of amino acid metabolism.
6. Discuss the synthesis of adrenaline from tyrosine.
7. Explain the non-oxidative deamination of aspartic acid from serine.

PHOTOSYNTHESIS

Questions carry two marks:

1. Mention the different type of photosynthetic pigments.
2. In what way porphyrin ring structure is of chlorophyll is differs from that of Heme.
3. What are the accessory photosynthetic pigments?
4. How NADPH is produced in photosystem I.
5. Why the synthesis of ATP during the light reaction requires both photosystem I and photosystem II.
6. How photophosphorylation is different from oxidative phosphorylation?
7. Explain the role of Ribulose 1, 5- Diphosphate decarboxylase in photosynthesis.
8. Write the HSK path way.
9. Explain the interdependency of light and dark reaction.
10. Write the reaction catalysed by Ribulose-1,5-DP carboxylase.
11. Name the electron carriers of the PS-I and PS-II
12. How F-6-P is produced from 3- phosphoglycerate during dark reaction
13. How are PS-I and PS-II different?
14. What is C4 pathway?
15. Give the significance of C-4 pathway.

Questions carry Four marks:

1. Explain the structure of photosynthetic apparatus
2. Differentiate the light and dark reaction of photosynthesis.
3. Explain the roles of photosystem I and photosystem II.
4. Write a note on photolysis of water.
5. Mention the differences between cyclic and non-cyclic photophosphorylation.
6. What are C_3 AND C_4 plants?
7. How the C_4 and C_3 Pathways are different?