P-201[BIOPHYSICAL CHEMISTRY AND BIOCHEMISTRY]

1. Answer the following questions. **[1 mark]**

1. The repeating units of proteins are
a) glucose units
b) amino acids
c) fatty acids
d) peptides

2. Amino acids are joined by
a) peptide bond
b) hydrogen bond
c) ionic bond
d) glycosidic bond

3. The primary structure of protein represents
a) Linear sequence of amino acids joined by peptide bond
b) 3-dimensional structure of protein
c) helical structure of protein
d) sub unit structure of protein

4. Peptide bond is
a) rigid with partial double bond character
b) planar, covalent
c) covalent
d) all of the above

5. Enzymes are
a) proteins
b) carbohydrates
c) nucleic acids
d) DNA molecule

6. The first protein sequenced by Frederick Sanger is
a) Haemoglobin
b) myoglobin
c) insulin
d) myosin

7. A dipeptide has
a) 2 amino acids and 1 peptide bond
b) 2 amino acids and 2 peptide bonds
c) 2 amino acids and 3 peptide bonds
d) 2 amino acids and 4 peptide bonds

8. The most common secondary structure is
a) α-helix
b) β-pleated sheet
c) β-pleated sheet parallel
d) β-pleated sheet non parallel

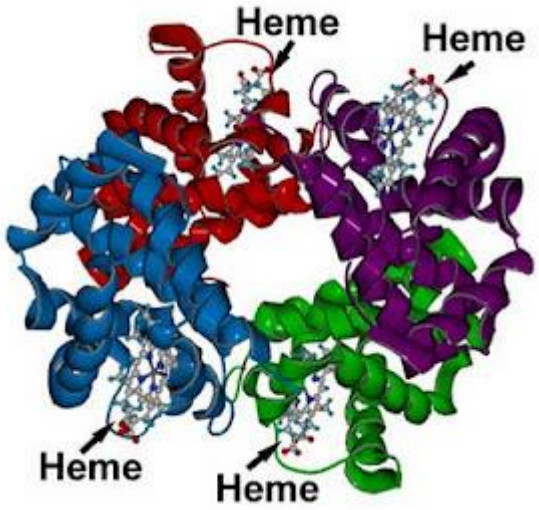
9. Myoglobin is a
a) protein with primary structure
b) protein with secondary structure
c) protein with tertiary structure
d) protein with quaternary structure

10. Fibrous protein such as silk fibroin consists of polypeptide chains arranged in
a) α-helix
b) β-pleated sheet
c) β-helix
d) none of these

11. α-helix has
a) 3.4 amino acid residues/turn
b) 3.6 amino acid residues/turn
c) 3.8 amino acid residues/turn
d) 3.0 amino acid residues/turn

12. Tertiary structure is maintained by
a) peptide bond
b) hydrogen bond
c) di-sulphide bond
d) all of the above

13. Haemoglobin has



a) primary structure
b) secondary structure
c) tertiary structure
d) quaternery structure

14. Disulphide bonds are formed between
a) cysteine residues that are close together
b) cystine residues that are close together
c) proline residues that are close together
d) histidine residues that are close together

15. The 3-D structure of protein can be determined by
a) Nuclear magnetic resonance
b) X-ray crystallography
c) both a and b
d) Spectroscopy

Answers

1-b	2-a	3-a	4-d	5-a
6-c	7-a	8-a	9-c	10-b
11-b	12-d	13-d	14-a	15-c

2.Answer the following questions within 2-3 sentences. [1.5 mark]

1. What are colligative properties ?
2. What do you mean by pH and buffer ?
3. What do you mean by reaction kinetics ? Mention it types
4. Why is reaction kinetics important ? State its unit .
5. What are aldose and ketoses ?
6. What is mutarotation ?
7. What is the difference between essential and non-essential fatty acids ?
8. Why un-saturated fatty acids have low melting points?
9. What do you mean by domains ?
10. State motifs .
11. What is energy transduction ? Give an example.
12. What is redox potential ?
13. What do you mean by electron transport chain.
14. Differentiate between de-novo and salvage pathway of nucleic acid bio-synthesis .

15. What do you mean by glycogen metabolism ?
16. What are transaminases ? Give its properties .
17. What is oxidative deamination ?
18. Name 3 hormones which are responsible for regulation of Urea cycle.
19. Mention energetics of Glycolysis.
20. Mention energetics of TCA cycle.

3. Answer the following questions within 75-100 words. [2 marks]

1. What are the different types of carbohydrates ?
2. What are epimers ?
3. Give the pyranose and furanose structure of D-fructose .
4. What are anomers ?
5. What are the general functions of biological lipids ?
6. What are triglycerids ?What are its types ?
7. Give the structure of amino acids . Add a note on function of proteins.
8. What is Ramachandran Plot ?
9. Give a brief account on secondary structure of proteins.
10. What are vitamins ?
11. Define transducers . What are its types ?
12. What is glycolysis ?
13. State TCA cycle.
14. What is oxidative phosphorylation?
15. What is gluconeogenesis ? State its significance .
16. Briefly describe about hormonal regulation of carbohydrate metabolism .
17. What is transamination ? Give its significance.
18. What is urea cycle ? Also mention about the site , discovery and importance of urea cycle .
19. What is β – oxidation of fatty acid ?
20. Discuss briefly about regulation of fatty acid metabolism .

4. Answer the following questions within 500 words. [6marks]

1. Explain the various stabilizing interactions.
2. Give the structure , types and functions of Carbohydrates.
3. Write the structure , types and function of lipids.
4. State the structure , types and function od amino acids and proteins.
5. What is Ramachandran Plot ?
6. Explain the secondary structure of Proteins .
7. Give a brief account on domains , motifs and folds.
8. Give a detailed account on Vitamins.
9. What are colligative properties ?
10. Write short on energy transduction in cell and types of transducers.
11. Give the energetics of Biochemical reaction. Add a note on redox potential.

12. Elaborate about energy transformation and bioenergetics in mitochondria.
13. Write the de novo and salvage pathway of nucleic bio-synthesis.
14. Explain about Glycolysis.
15. What is TCA cycle ?
16. Explain oxidative phosphorylation.
17. Write about electron transport chain and ATP synthesis.
18. What do you understand by gluconeogenesis.
19. State about glycogen metabolism .
20. Give an account on regulation of carbohydrate metabolism .
21. What is transamination ? Explain.
22. Write about oxidative deamination .
23. Explain Urea Cycle.
24. State about biosynthesis of fatty acid.
25. Give an account on regulation of Fatty acid metabolism.
26. What do you understand by β – oxidation of fatty acids?