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322501

December 2023

B.Sc. (Chemistry) - V SEMESTER

Organic Chemistry-IV (BCH-501)

Time : 3 Hours] [Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART–A

1. (a) What is the complementary base sequence of DNA if one strand of DNA double helix has sequence AGCTTCGA? (1.5)

(b) Draw and name the linkages in CTP. (1.5)

(c) Differentiate between lipoproteins and glycoproteins. (1.5)

(d) Write the reaction catalyzed by transferases. (1.5)

(e) How can alanine (pI=6.0), glutamic acid (pI=3.2) and lysine (pI=9.7) be separated in a buffer of pH 6 by electrophoresis? (1.5)

(f) How do the enzymes speed up the reaction? (1.5)

(g) Name the natural and synthetic antioxidants to prevent rancidity. (1.5)

(h) What is the action of carboxypeptidase on polypeptide? (1.5)

(i) Draw the structure of the electron transfer agent in biological system. (1.5)

(j) Write the reaction of glycolytic pathway catalysed by aldolase. (1.5)

PART–B

2. (a) Discuss the functions of nucleotides. Explain the structure of t-RNA. (5)

(b) Write the synthesis of cytosine (Wheeler and Johnson method). (5)

(c) Draw the Watson and Crick double helical structure of DNA. Write the hydrogen bonding in purines and pyrimidines. (5)

3. (a) Write the synthesis of dipeptide Tyr-Ser. List the advantages of solid phase peptide synthesis. (5)

(b) Discuss the following reactions :

(i) Ser-Lys-Asp-Ala with phenyl isothiocyanate followed by aq. HCl and $Ba(OH)_2$.

(ii) Synthesis of leucine from 4-methylpentanoic acid. (5)

(c) Explain the different bonds responsible for formation of tertiary structure of protein. (5)

4. (a) Explain the various factors affecting the enzyme activity. (5)

(b) Discuss the importance of competitive inhibition in enzyme action with examples. (5)

(c) Describe the role of catalytic triad and specificity of trypsin. (5)

5. (a) What do you understand by preparatory and pay off phases in glycolysis? (5)

(b) Discuss the metabolic fates of pyruvate under aerobic and anaerobic conditions. (10)

6. (a) Explain the

(i) Denaturation of proteins.

(ii) Isoelectric point.

(iii) Standard free energy of hydrolysis for ATP.

(iv) Reaction of guanine with HNO_2. (8)

(b) Describe the methods used to determine the primary structure of proteins. (7)

7. Write short note on following :

(a) Saponification.

(b) Significance of iodine value and acid value.

(c) Oxidative rancidity.

(d) Differentiate between following with example :

(i) MUFA and PUFA.

(ii) Simple and mixed triglyceride. (15)
