S-5/CEMH/CC-11/21

TDP (Honours) 5th Semester Exam., 2021

CHEMISTRY

(Honours)

ELEVENTH PAPER (CC-11)

Full Marks : 60 *Time* : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer Question No. 1 and other four questions, taking one from each unit.

1. Answer *any* **six** questions of the following : 2×6=12

(a) What is meant by Zwitterion? Write the structure of the Zwitterion of alanine.

(b) What happens when alanine is treated with aq·HNO_2? Cite the reaction.

(c) In a DNA molecule, why are the ratios $\frac{[A]}{[T]}$ and $\frac{[G]}{[C]}$ both equal to unity?

(d) What is the major force that stabilises the DNA double helix?

(e) What are oils and fats?

(f) What is meant by the term triglyceride?

(g) What are the forces responsible for protein folding?

(h) Why enzymes are superior to ordinary catalysts?

UNIT—I

2. (a) Describe the stereochemistry of alanine.

(b) How can you prepare phenyl alanine by Gabriel phthalimide synthesis?

(c) Write a short note on Erlenmeyer azlactone method of synthesis of amino acids.

(d) What happens when alanine reacts with formaldehyde? 2+4+4+2=12

3. (a) Specific rotation of α-amino acids is pH dependent. Explain.

(b) What is meant by denaturation of proteins?

(c) Write two reagents for the activation of –COOH group of an α-amino acid having $-NH_2$ group blocked. Write the reaction involved.

(d) Explain Sanger's method of *N*-terminal amino acid determination. 3+2+4+3=12

[Continued]

UNIT—II

4. *(a)* Write down the structure of guanine. What are the structural differences of guanine and thymine? Name the complimentary bases of these.

   (b) Carry out the following transformations :

   (i) Thiourea → adenine
   (ii) Guanidine → guanine

   (c) What are polynucleotides? Draw the structure of trinucleotide ATG as a part of a DNA molecule. (1+1+2)+4+4=12

5. *(a)* What are the major classes of enzymes? Write the major types of reaction catalyzed by them.

   (b) Discuss Fischer's template and Koshland's induced fit model for enzyme-substrate interactions.

   (c) What are oxidoreductase? Describe the stereoselective behaviour of succinate dehydrogenase. (2+2)+(2+2)+(1+3)=12

UNIT—III

6. *(a)* What do you mean by auto-oxidation of unsaturated fat? Explain.

   (b) What are LDL and HDL? How does LDL lead to coronary heart disease?

(c) What are lipids? Write the biological importance of lipids.

(d) What is soap? 3+(2+2)+3+2=12

7. (a) Outline the sequence of reaction involved in Krebs' cycle.

(b) What do you mean by catabolic pathways of fat?

(c) Explain the major role of FAD for oxidative phosphorylation.

(d) How can you calculate the calorific value of carbohydrates?

4+3+3+2=12

UNIT—IV

8. (a) What are antipyretics? Mention the side effects of these drugs.

(b) Outline the synthesis of paracetamol.

(c) Write the structure of vitamin-C and discuss its chemical importance.

(d) Write the medicinal use of curcumin. Mention the major side effects due to over intake of it. (2+1)+4+(1+2)+(1+1)=12

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9. *(a)* What is the basic difference between antiseptic and disinfectant? Name a substance which can be used as an antiseptic as well as a disinfectant.

(b) Give the syntheses and pharmaceutical importance of the following :

(i) Chloramphenicol

(ii) Ibuprofen

(c) What are antibiotics? Mention the main characteristics of an antibotic. Name the first antibiotic discovered.

2+(3+3)+(1+2+1)=12

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