TDP (Honours) 5th Semester Exam., 2019

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 *four* questions, taking *one* from each unit.

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

   (a) What happens when glycine is treated with $CuSO_4$ in basic medium? Write the reaction.

   (b) Amino acid cannot be directly titrated with alkali. — Explain why?

   (c) Why RNA undergoes hydrolysis but DNA does not?

   (d) What are co-enzymes? Cite an example.

[Turn Over]

(e) What do you mean by low caloric fats?

(f) Calculate the amount of free energy change during hydrolysis of ATP.

(g) What do you mean by gluconeogenesis and glucogenesis?

(h) Write down the medicinal value of curcumin and azadirachtin.

Unit - I

2. (a) What is isoelectric point of an amino acid? Derive a relation for isoelectric pH of an amino acid with its pK_1 and pK_2.

(b) Name two blocking reagent of NH_2 group of α-amino acid. Mention their deblocking procedure.

(c) Synthesize Gly-Ala-Val using Merrifield method. Mention one advantage of this method.

4+4+(3+1)=12

3. (a) Describe with mechanism, the synthesis of α-amino acid via azlactone intermediate formation.

(b) How C-terminal residue of a peptide can be determined?

(c) What do you mean by tertiary structure of protein?

(d) Write down the ninhydrin test for identification of α-amino acids. 4+3+2+3=12

Unit - II

4. (a) Write down the structure of uracil. Suggest a method of its synthesis from urea.

(b) Suggest a method of synthesis of each of the following and write down the reaction involved

(i) adenine (ii) guanine

(c) What are nucleotides and nucleosides? Draw the structure of a nucleotide containing a purine base. 3+(3+3)+3=12

5. (a) What do you mean by competitive and non-competitive inhibitors?

(b) Write the mechanism of enzyme action.

(c) Briefly discuss the factors affecting enzyme action.

(d) Define allosteric inhibition of enzyme. 4+3+3+2=12

[Turn Over]

Unit - III

6. (a) What is rancidity? How can it be prevented?

   (b) Define saponification value, acid value and iodine value of an oil?

   (c) Illustrate with suitable example (i) hydrogenation of oil and (ii) transesterification.

   2+(2+2+2)+4=12

7. (a) Discuss the role of ATP in biochemical processes.

   (b) Outline the sequence of reaction involved in glycolysis.

   (c) Briefly discuss conversion of pyruvate into acetyl-CoA.

   (d) Calculate ΔG° for the following reactions :

   (Cytochrome c) - Fe^{II} + (Cytochrome f) $Fe^{III} \rightarrow$ (Cytochrome c) - Fe^{III} + (Cytochrome f) - Fe^{II}, the value of $E^\circ = 0.11V$. 3+4+3+2=12

Unit - IV

8. (a) Write a green synthesis and therapeutic use of ibuprofen.

   (b) Write the chemical name and structure of vitamin C. Briefly mention its chemical importance.

(c) Write a method of synthesis of ranitidine. Mention its side effects.

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

9. (a) What are antimalarials? Write a method of synthesis of chloroquine.

(b) Outline the synthesis of Chloramphenicol. Mention one use of it.

(c) What are antibiotics? Mention the characteristics of antibiotics. 4+(3+1)+4=12
