

Total number of printed pages-8

3 (Sem-5/CBCS) CHE HC 1

2022

## CHEMISTRY

(Honours)

Paper : CHE-HC- 5016

(Organic Chemistry-IV)

Full Marks : 60

Time : Three hours

**The figures in the margin indicate full marks for the questions.**

1. Answer the following questions :

**(any seven)**

1×7=7

- What is the most stabilizing force for nucleic acids ?
- Which property is commonly shared by GDP and AMP ?
- Name *one* Ketogenic amino acid.
- Which enzyme helps in the formation of phosphodiester bond ?

Contd.

(e) Statin drug is an example of \_\_\_\_\_ inhibition. (Fill in the blank)

(f) In which site of the cell-beta oxidation takes place ?

(g) Give an example of complex lipid.

(h) Through which process energy is obtained by red blood cells ?

(i) How many chiral centres are present in Ibuprofen molecule ?

(j) What are stop codons ?

(k) Name *one* enzyme which is secreted by the pancreas.

(l) Name what class of drug is ranitidine ?

2. Answer the following : (**any four**)  $2 \times 4 = 8$

(a) Draw the base present in deoxyadenosine monophosphate and deoxyguanosine monophosphate.

(b) Write the significance of base-pairing in DNA.

(c) Give *one* example of biologically important peptide and write *at least two* functions.

(d) What happens when an  $\alpha$ -amino acid is heated ? Write reaction.

(e) How are lipids classified ?

(f) What is the root cause of malaria ? Write the structure of *one* antimalarial drug.

(g) Draw the structure of  $\text{NAD}^+$  and  $\text{NADH}$ .

(h) Write *one* function each of  $\text{NAD}^+$  and  $\text{FAD}$ .

3. Answer **any three** of the following :

$5 \times 3 = 15$

(a) Describe the double helical structure of DNA. Anticodon is present in which type of RNA ?  $4 + 1 = 5$

(b) (i) Give the structure of Lysine. Find the isoelectric point of Lysine of which  $pK_{a1}$  is 2.18  $pK_{a2}$  is 8.95 and  $pK_{a3}$  is 10.53.

(ii) How many tripeptide bonds are formed by various combination of Gly, Ala and Phe ? Explain.

$3 + 2 = 5$

(c) Write briefly about classification of enzymes. How active sites are subdivided ?  $4+1=5$

(d) Hydrolysis of ATP results in release of energy. Explain.

(e) What is respiratory quotient of foodstuff ? What does it signify ?  $3+2=5$

(f) What are narcotics and non-narcotics drugs ? Give example of each type. Write chemical name of Analgin and its uses.  $3+2=5$

(g) What are tetracyclines ? How it is different from streptomycin ? Give an example of tetracycline.  $2+2+1=5$

(h) (i) What happens when an  $\alpha$ -amino acid is allowed to react with formaldehyde ? What is the significance of this reaction ? 3

(ii) What is chrome protein ? Give an example. 2

4. Answer **any three** :  $10 \times 3 = 30$

(i) (a) Write *one* method of each synthesis of Adenine and Thymine.

(b) Describe a method how the C-terminal residue of a polypeptide chain can be analyzed.

(c) Name *one* amino acid which is not found in  $\alpha$ -helix.  $5+4+1=10$

(ii) (a) Explain the process of protein biosynthesis (Translation). 5

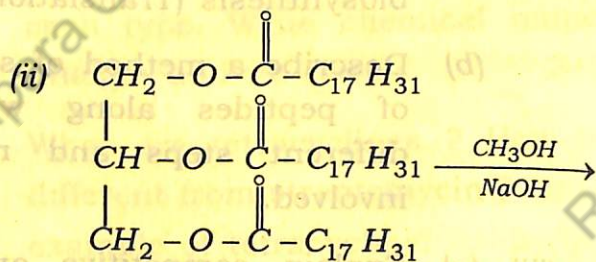
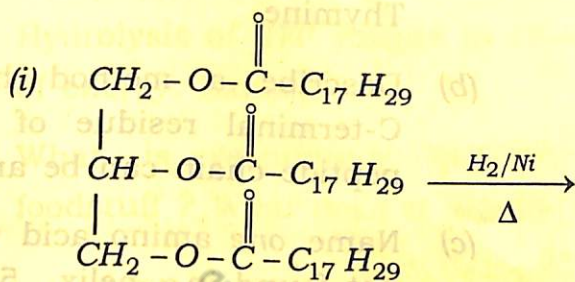
(b) Describe a method of synthesis of peptides along with the different steps and reactions involved. 5

(iii) (a) Explain competitive and non-competitive inhibition of enzyme with examples.

(b) Name *one* metalloenzyme with its specificity.

(c) What is special about allosteric inhibition ?  $6+2+2=10$

- (iv) (a) Find the products of the following reactions of fats/oils :  
 $1\frac{1}{2} \times 2 = 3$



- (b) Explain acid value and iodine value of oils or fats. Why these two parameters are important ?

$$2 \times 2 = 4$$

- (c) What are isozymes ? Explain with example.

3

- (v) (a) Write the major steps involved in glycolysis indicating the enzymes that regulate the process.

- (b) What is citric acid cycle ? Draw the cycle with different intermediate formed. How many ATPs are produced during one cycle ?  $5 + (4 \times 1) = 10$

- (vi) (a) Write different steps involved in the synthesis of chloroquine.

- (b) How chloramphenicol can be prepared from a suitable substrate ?

- (c) What is ranitidine ? What are the side effects of using antacid for long ?  $4 + 4 + 2 = 10$

- (vii) (a) Show diagrammatically A-T and G-C base pairing.

- (b) Write the structure of the bases found in RNA.

- (c) Write the structure of dAMP.

- (d) Describe the solid-phase synthesis of peptides.

$$3 + 2 + 1 + 4 = 10$$