

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 α -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 NAD^+ and NADH .
- (h) Write *one* function each of NAD^+ and 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 α -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 α -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

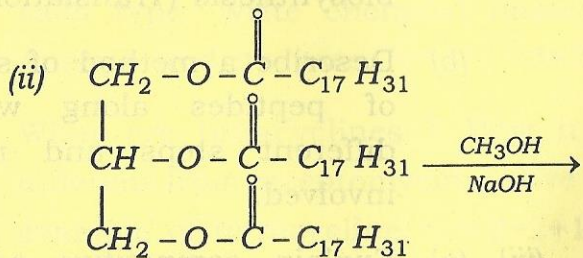
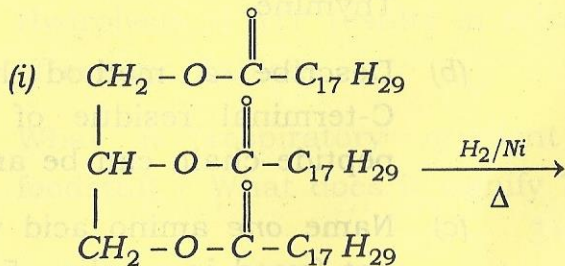
(iii) (a) Explain competitive and non-competitive inhibition of enzyme with examples.

(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.

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(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 ?

$$5 + (4 + 1) = 10$$

(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.

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

- (viii) (a) Write a method of synthesis of paracetamol.
- (b) Mention *four* qualities that an antibiotic must possess.
- (c) Point out the essential difference between oils and fats.
- (d) Mention *one* medicinal value of turmeric and neem.
- (e) What do you mean by rancidity? How can rancidity be minimised in foods ? $2+2+2+2+2=10$
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