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

   (a) What is the most stabilizing force for nucleic acids ?

   (b) Which property is commonly shared by GDP and AMP ?

   (c) Name *one* Ketogenic amino acid.

   (d) 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)*** 2×4=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 : 5×3=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 *pKa*1 is 2.18 *pKa*2 is 8.95 and *pKa*3 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*** : 10×3=30

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

(b) Describe a method how the C-terminal residue of a poly-peptide 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

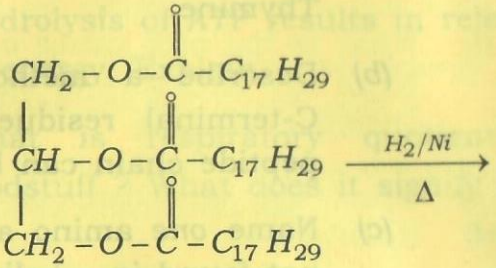
(b) Describe a method of synthesis of peptides along with the different steps and reactions involved. 5

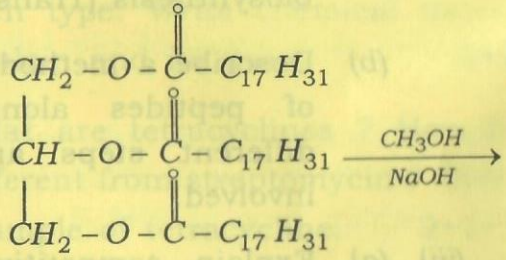
(iii) (a) Explain competitive and non-competitive inhibition of enzyme with examples.

(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 : 1½×2=3

(i)


(ii)


(b) Explain acid value and iodine value of oils or fats. Why these two parameters are important ? 2×2=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+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 diagramatically 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
