3 (Sem–5/CBCS) CHE HC 1

2023

CHEMISTRY

(Honours Core)

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 : $1 \times 7 = 7$

   (a) Nucleoside + Phosphate = ?

   (b) A Nucleotide is represented as _____ .

   (c) Except _____ all α-amino acid are
   optically active.

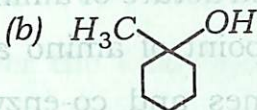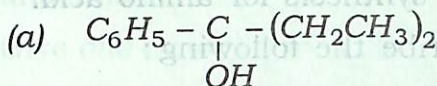   *(d)* $\overset{+}{N}H_3 - CH_2 - CO - NH - CH_2 - COO^-$

   It is a dipeptide. Name the component
   amino acid.

(e) What causes the disease sickle cell anaemia ?

(f) Give *one* example of oxidative enzymes.

(g) Give an example of simple triglyceride.

2. Answer the following questions :   2×4=8

(a) Comment on the statement that ATP acts as a universal currency of free energy in biological synthesis.

(b) What products would be formed when a nucleotide from DNA – containing Thymine is hydrolysed ?

(c) What happens when alanine is treated with nitrous acid ? Give reaction.

(d) What do you mean by functional group interchange (FGI) and functional group addition ?

3. Answer *any three* of the following :
    5×3=15

(a) What are the names of ribonucleosides of the *five* different bases, and also write the name of the bases ?

(b) Draw a structure of nucleotide by showing phosphodiester linkage between 5' and 3' carbon atoms of the pentose sugar.

(c) Give the reaction of phthalimidomalonic ester synthesis for amino acid.

(d) Describe the following :

(i) Zwitterion structure of amino acid

(ii) Isoelectric point of amino acid

(e) What are enzymes and co-enzymes ? Give example.

4. Answer *any three* of the following questions :   10×3=30

(i) (a) What is the difference between oils and fats ?   5

(b) What do you mean by acid value and hardening of oils ?   5

(ii) Write notes of the following :
    3+3+4=10

(a) Oxidation of food stuffs and cellular energy

(b) Catabolism and anabolism

(c) Metabolic path ways of Carbohydrates

(iii) (a) How malaria is caused ? Name some useful drugs which are employed as antimalarials. How pamaquine is synthesised ?   5

(b) Describe the synthesis of Chloramphenicol.   5

(iv) Give the retrosynthesis of   5+5=10

(a) $C_6H_5 - \underset{\underset{OH}{|}}{C} - (CH_2CH_3)_2$

(b) H_3C — OH (cyclohexane structure)

from Grignard reagent.

(v) (a) What is meant by nucleosides and nucleotides ? Give *one* example of each.   3

(b) Write down the structure of nucleosides which is present only in RNA.   3

(c) What are the functions of nucleic acids in the human body ?   4

(vi) (a) Amino acids are weaker acids than carboxylic acids. Explain why ?   2

(b) What do you mean by *N*-terminal and *C*-terminal residue in proteins ? How are these identified ?   4

(c) Explain the biological importance of proteins.   4

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