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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 : 1×7=7

(a) Nucleoside + Phosphate = ?

(b) A Nucleotide is represented as ____.

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

(d) $\text{NH}_3^+ - \text{CH}_2 - \text{CO} - \text{NH} - \text{CH}_2 - \text{COO}^-$

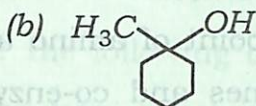
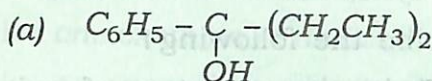
It is a dipeptide. Name the component amino acid.

Contd.

- (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 : $2 \times 4 = 8$
- (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 : $5 \times 3 = 15$
- (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 phthalimidomalonate 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 : $10 \times 3 = 30$
- (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 $5+5=10$



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