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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 : $1 \times 7 = 7$

(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.

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.

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- (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

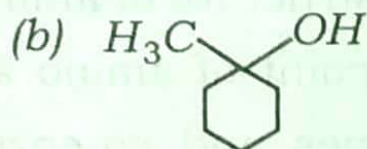
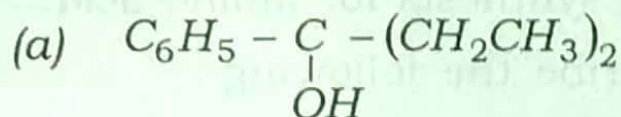
- (iii) (a) How malaria is caused? Name some useful drugs which are employed as antimalarials. How pamaquine is synthesised? 5

- (b) Describe the synthesis of Chloramphenicol. 5

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Contd.

(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