Total No. of Printed Pages—7

5 SEM TDC CHMH (CBCS) C11

2025

(Nov/Dec)

CHEMISTRY

(Core)

Paper : C–11

(Organic Chemistry)

Full Marks : 53

Pass Marks : 21

Time : 3 hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer from the following : 1×4=4

(a) Adenine present in DNA is

(i) purine base

(ii) pyrimidine base

(iii) nucleotide

(iv) nucleoside

(b) ATP contains

(i) one phosphate ester

(ii) two phosphate esters

(iii) three phosphate esters

(iv) None of the above

(c) Which of the following is a simple lipid?

(i) Oils and fats

(ii) Glycolipids

(iii) Phospholipids

(iv) Cholesterol

(d) Synthetic equivalent of $\overset{\oplus}{C}H_3$ is

(i) CH_3Cl

(ii) CH_3CH_3

(iii) $CH_3—C\equiv CH$

(iv) CH_3MgBr

UNIT—I

2. (a) Explain the term 'nucleotide'. 2

Or

Show the hydrogen bonds between adenine and thymine, and guanine and cytosine.

(Continued)

(b) Discuss the replication process of DNA. What is its significance? 1+1=2

(c) Discuss the structure of DNA. 2

Or

Discuss the process of protein synthesis. 1+1=2

UNIT—II

3. (a) Describe Gabriel phthalimide synthesis for amino acids. 2

(b) Give DNP and Edman methods of N-terminal analysis in case of proteins. 2

(c) Write a short note on primary and secondary structures of proteins. 2

(d) Discuss the classification and biological importance of proteins. 2

UNIT—III

4. (a) What are enzymes and coenzymes? 2

(b) Write a short note on Fischer's lock and key model of enzyme action. 2

(Turn Over)

(c) Explain enzyme kinetics and also explain the factors which effect the rate of enzymatic reactions. 3

(d) What are competitive and non-competitive inhibitions? 2

UNIT—IV

5. (a) How will you distinguish between a fat and an oil? 2

(b) Give an example of *trans*-esterification in case of glycerides. 2

Or

Write a brief note on detergents bringing out structural relationship (if any) between soaps and detergents.

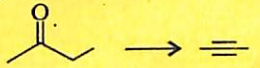
(c) What are glycerides? How are they classified? Give examples. 1+1=2

(d) What is rancidity? Which reactions are responsible for the development of rancidity? 1+1=2

(Continued)

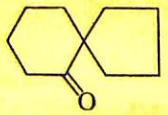
UNIT—V

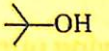
6. (a) How can the following FGIs be carried out? 1+1=2

(i) 

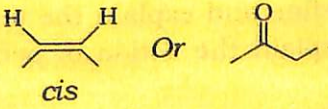
(ii) —COOR ⟶ —CH_2OH

(b) Synthesize the following compounds with proper retrosynthetic analysis (any *one*) : 2

(i) 

(ii) 

(c) How is the following compound synthesized? Give proper retrosynthetic analysis : 1+1=2



cis

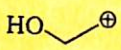
(d) Write the synthetic equivalent of the following compounds : ½×4=2

(i)

(Turn Over)

(ii) 

(iii) 

(iv) 

(e) How would you synthesize the following compound by using Wittig reaction? Give retrosynthesis and synthetic pathways : 2

UNIT—VI

7. Answer any *four* of the following questions : 2×4=8

(a) Describe the synthesis of an antimalarial drug.

(b) Define and explain the term 'antibiotic'. Explain the action of penicillin.

(c) Discuss the medicinal uses of curcumin and vitamin C.

(d) Discuss the mode of action of sulphanilamides.

(Continued)

(e) Prepare the following :

(i) Aspirin

(ii) Ibuprofen

(f) Describe the synthesis of chloramphenicol.

★ ★ ★