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5 SEM TDC CHMH (CBCS) C 11

2024

(November)

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) Uridine present in RNA is

- (i) nucleotide
- (ii) pyrimidine
- (iii) purine
- (iv) nucleoside

(b) A DNA segment contains 100 adenine and 100 cytosines, how many nucleotides are present in the segment?

☒ (i) 100

(ii) 200

(iii) 400

(iv) 50

(c) Which of the following is not a lipid?

(i) Fat

(ii) Oil

(iii) Protein

(iv) Wax

(d) Which of the following best describes a synthon?

(i) A synthetic reagent used in a reaction

(ii) A key intermediate in a reaction sequence

(iii) A transition state involved in a reaction mechanism

(iv) A hypothetical structure that would result in a given reaction if it existed

UNIT—I

2. (a) DNA is more stable than RNA. Explain. 2

Or

Synthesize any *one* of the following bases : 2

(i) Adenine

(ii) Guanine

- (b) Discuss the biological roles of DNA and RNA. 2

- (c) Discuss the Watson model of DNA molecule. 2

Or

What are complementary bases? Draw the structure to show hydrogen bonding between adenine and thymine. 1+1=2

UNIT—II

3. (a) How are α -amino acids prepared? Describe the important reactions of α -amino acids. 2

- (b) What happens when glycine is treated with 2,4-dinitrofluorobenzene (DNFB)? 2

- (c) Synthesize glycine with the help of Strecker's reaction. 2

- (d) Discuss the α -helical structure of protein. 2

UNIT—III

4. (a) Define enzyme. How does pH affect the activity of enzymes? 1+1=2
- (b) Write a short note on specificity of enzymes with the help of a suitable example. 2
- (c) Define the term 'active site'. Give a brief diagram for the mechanism of enzymatic action. 1+2=3
- (d) What are the cofactors present in enzymes? Give an example of a coenzyme with a specific reaction. 1+1=2

UNIT—IV

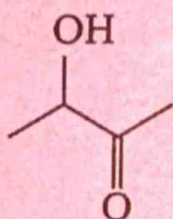
5. (a) What are oils and fats? How do they differ from each other? 1+1=2
- (b) What is rancidity? How can you prevent rancidity? 1+1=2

Or

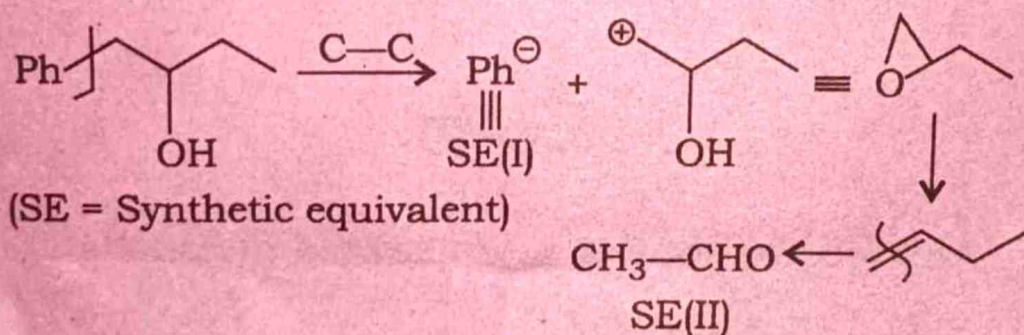
- What is iodine value? What is its significance? 1+1=2
- (c) What are triglycerides? Identify the hydrophobic and hydrophilic regions of a triglyceride. 2
- (d) How do you isolate carboxylic acid and alcohol from fats and oils? 2

UNIT—V

6. (a) Simply show that where to disconnect and mention the synthons and synthetic equivalents of the following : 2



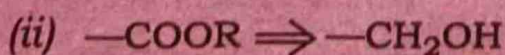
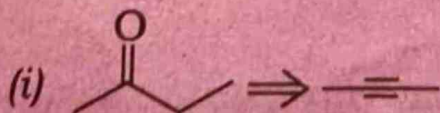
- (b) From the disconnection pattern shown below, synthesize the following TM : 2



- (c) How would you synthesize the following TM, working reverse with Wittig reaction? 2

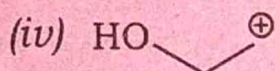
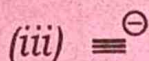
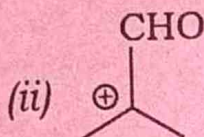
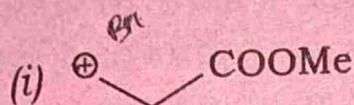


- (d) How can the following FGIs be carried out? 2



(e) Write the synthetic equivalent of the following compounds :

2



UNIT—VI

7. Answer any four of the following questions :

2×4=8

(a) Draw the structure of Ibuprofen. Give one important use of it.

(b) How do the sulpha drugs prevent the growth and multiplication of bacteria when administered into a host body?

(c) Synthesize a drug which can be used as analgesic and antipyretic from phenol.

(d) Define broad spectrum and narrow spectrum antibiotics giving one example of each.

(e) What is tincture of iodine? What is its use?

✓ (f) Write in brief about the medicinal importance of *Azadirachtin* (Neem).

★ ★ ★