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:
 - (a) Uridine present in RNA is
 - (i) nucleotide
 - (ii) pyrimidine
 - (iii) purine
 - (iv) nucleoside

(b)	A DNA segm	ent co	ntains	100	ad	lenine
	and 100	cytosi	nes,	how		many
	nucleotides segment?	are	prese	nt	in	the

- (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.

Or

Synthesize any one of the following bases:

- (i) Adenine
- (ii) Guanine
- (b) Discuss the biological roles of DNA and RNA.
- (c) Discuss the Watson model of DNA molecule.

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.

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

- (c) Synthesize glycine with the help of Strecker's reaction.
- (d) Discuss the α-helical structure of protein.

2

2

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2

2

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.
 - (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.
- (d) How do you isolate carboxylic acid and alcohol from fats and oils?

UNIT-V

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

OH OH

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

Ph \rightarrow C—C \rightarrow Ph \ominus \rightarrow OH \rightarrow OH \rightarrow CH₃—CHO \leftarrow SE(II)

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

Ph

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

(i) → → -=-

(ii) $-COOR \Longrightarrow -CH_2OH$

2

2

2

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2

- (e) Write the synthetic equivalent of the following compounds:
- 2





- (iii) ≡
- (iv) HO 🗡

UNIT-VI

7. Answer any four of the following questions:

 $2 \times 4 = 8$

- (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).

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