

B.Sc. Semester - 5 (Remedial) (CBCS) Examination**March/April-2025 (NEW COURSE)****Organic Chemistry and Spectroscopy(Core)****Time: 2:30 Hours****Marks: 70****Instructions:**

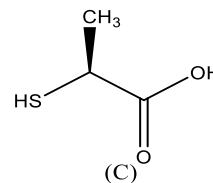
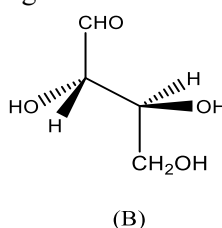
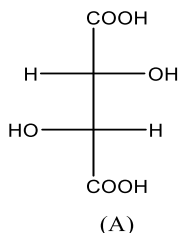
1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1(A) Answer the following question. (04)

What is sweetening agents ? Give the synthesis and uses of (I) Sucrol (II) N-(4-methoxy phenyl) urea

Que.1(B) Answer any two questions out of three. (10)

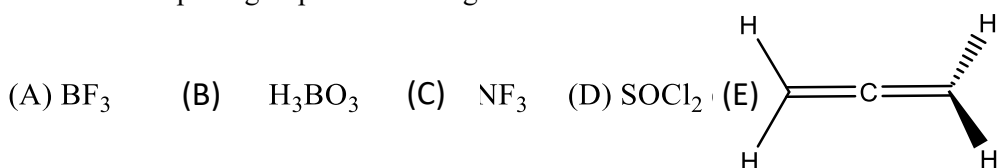
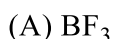
- 1) Give the difference with suitable example
(i) Anomers and Epimers (ii) Asymmetric and Disymmetric
- 2) Give the synthesis of
(i) Tryptophan by Erlenmeyer azlactone synthesis
(ii) Gly-Phe-Ala by Fischer's method
- 3) Determine the absolute configuration of following molecules (2+2+1)

**Que.2(A) Answer the following question. (04)**

Determine the point group of trans 1,3-butadiene and prepare multiplication table for it

Que.2(B) Answer any two questions out of three. (10)

- 1) Explain with mechanism and give application : Bischler – Napieralski reaction
- 2) Write reaction for following (1+3+1)
(a) Coniine reacts with con. HI at 300°C
(b) Pinner's bromination reaction for Nicotine
(c) Papaverinol reacts with hot and diluted KMnO₄
- 3) Determine the point groups of following molecules

**Que.3(A) Answer the following question. (04)**

Give the synthesis and uses of (i) Orange-II (ii) Ibuprofen

Que.3(B) Answer any two questions out of three. (10)

- 1) An organic molecule has fruity smell and the molecular weight is 164 gm/mol and shows Following NMR data Deduce the structure with explanation of following NMR data

Signal	No. of Proton	Multiplicity	δ ppm
a	3H	Triplet	1.2
b	3H	Singlet	2.1
c	2H	Quartet	4.2
d	2H	Doublet	7.2
e	2H	Doublet	7.4

Deduce the structure of this molecule with illustration of above NMR data

- 2) Discuss the types of ions/peaks produced by the ionization in mass spectra (any five)
- 3) Discuss the factors affecting on chemical shift in NMR Spectroscopy (any five)

Que.4(A) Answer the following question. (04)

Give the classification of α -amino acids with examples

Que.4(B) Answer any two questions out of three. (10)

- 1) Discuss the conformation of cyclohexane with energy diagram
- 2) How to estimate four methoxy groups in Papaverine and N-CH₃ group in Nicotine. Write proper equations and name of the reactions respectively.
- 3) What type of informations is obtained from the following data in NMR – spectra
(A) No. of signals (B) Position of signals (C) Intensity of signals
(D) Multiplicity of signals (E) Coupling constant – J

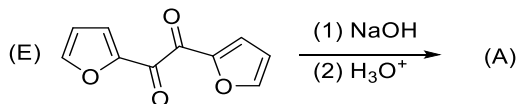
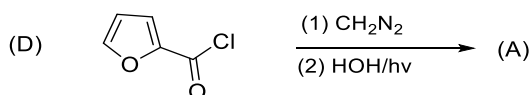
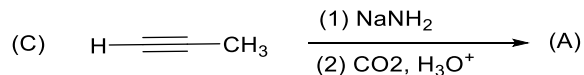
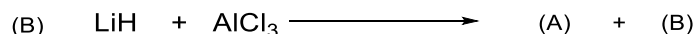
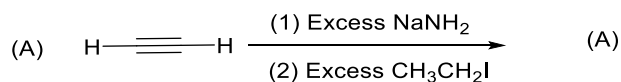
Que.5(A) Answer the following question. (04)

Give the no. of pmr signals and their multiplicity of following molecules.

- (A) Di-ter-butyl acetylene (B) p-ethyl anisol
(C) 1,2-dibromo-1,1-difluoro ethane (D) Acetonyl acetone

Que.5(B) Answer any two questions out of three. (10)

- 1) Give the synthesis of Thyroxine
- 2) Complete the following reactions



- 3) Discuss mass spectra of alkane compounds

Spectroscopic data

NMR: δ_{ppm}

Alkane C-H	0.9 – 2.5 δ_{ppm}
Alkyne C-H	2.5 – 3.9 δ_{ppm}
Alkene C-H	5.5 – 6.5 δ_{ppm}
Aromatic C-H	6.5 – 8.5 δ_{ppm}
Phenolic O-H	4.4 – 8.8 δ_{ppm}
Aldehydic C-H	8.0 – 10.0 δ_{ppm}
Acidic O-H	10.0 – 12.5 δ_{ppm}