19-3-25

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Reg. No. : .....

Name : .....

Third Semester M.Sc. Degree Examination, March 2025

Chemistry/Analytical Chemistry/Polymer Chemistry

CH 232/CL 232/PC 232 : ORGANIC CHEMISTRY III

(2020 Admission Onwards)

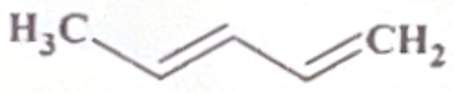
Time : 3 Hours Max. Marks : 75

SECTION – A

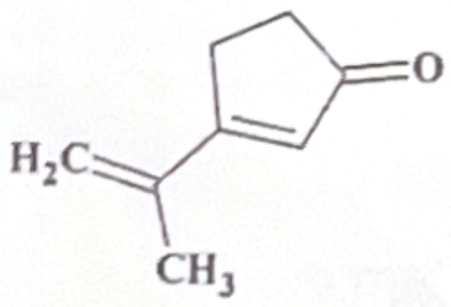
Answer **any** two sub – questions among (a), (b) or (c). Each question carries **2** marks.

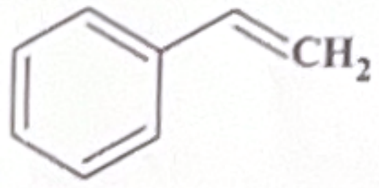
1. (a) Distinguish between the UV spectra of the following molecules:

(i) 

(ii) 

(b) Calculate the λmax for the following molecules using Woodward — Fieser rules.

(i) 

(ii) 

(c) What is EIMS in mass spectrometry?

P.T.O.

2. (a) What is the difference between first order and non first order spectra?

(b) What are the applications of NOE?

(c) What is the use of shift reagent?

3. (a) What is Gilman reagent? What is its use?

(b) What is the mechanism of Glaser coupling?

(c) What are the applications of Tebbe's reagent?

4. (a) What is the principle of Umpolung concept?

(b) What is Grubbs catalyst? Where is it used?

(c) What is the advantage of split and pool method?

5. (a) What is Clemmensen reduction?

(b) What is McFadyen–Stevens reaction?

(c) What is the Moffatt oxidation process?

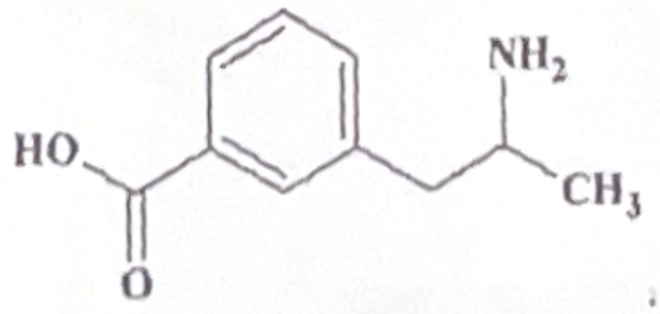
(10 × 2 = 20 Marks)

SECTION – B

Answer either (a) or (b) of each question. Each question carries **5** marks.

6. (a) Compare the IR frequency bands of 2–amino phenol and 4-amino phenol. Justify your answer.

(b) Explain the mass spectral fragmentation pattern of



7. (a) What is HMBC NMR? How is it different from HSQC NMR?

   (b) Elucidate the structure of the organic compound (molar mass — 152) whose spectral details: UV (nm): 257 and 297, IR (cm^{-1}) : 3502, 3026, 2932, 1726,1492, 1459, 1207, 1105 and 749.

8. (a) Discuss the methods of preparation of organochromium compounds.

   (b) Discuss the mechanism of a reaction involving silane carbanions.

9. (a) Discuss the mechanism of Negishi coupling reaction.

   (b) Discuss the method of protection and de–protection of carboxylic acids.

10. (a) Discuss the mechanism of reduction of organic compounds using pinacol borane.

    (b) Illustrate the use of O_sO_4 in oxidation of organic molecules.

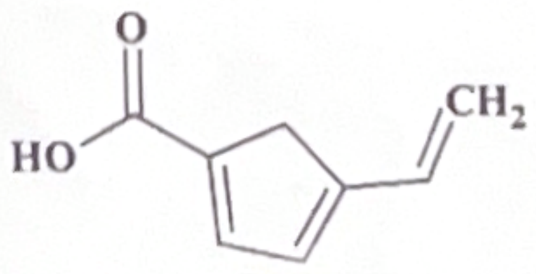
(5 × 5 = 25 Marks)

SECTION – C

Answer any **three** questions. Each question carries **10** marks.

11. (a) Explain the effects of different solvents on UV spectra.

    (b) Draw the mass spectra of following molecule and indicate the possible fragmentations



12. Elucidate the structure of the organic compound whose spectral details: UV: 258 nm, IR: 3502, 3038, 2929, 1602, 1502, 1456, 1421 and 801, ^{1}H-NMR: 1.12 (s, 3H), 1.21 (s, 3H), 7.12 (d, IH), 7.18 (d, 1H), 7.24 (d, 1H) and 7.28 (d, 1H) ppm and Mass spectra: 15, 115, 130 and 145 (M+) m/z values.

13. (a) Describe the lithium exchange reactions

(b) Discuss the advantages of Grignard reactions..

14. (a) What is Suzuki coupling reaction?. Describe its mechanism

(b) Explain the process of retrosynthesis and its advantages.

15. Explain the use of $NaBH_4$ and $LiAlH_4$ in organic reduction. What are their advantages?

(3 × 10 = 30 Marks)
