

Reg. No. :

Name :

Third Semester M.Sc. Degree Examination, March 2022

Chemistry/Polymer Chemistry/Analytical Chemistry

CH/CL/PC 232 : ORGANIC CHEMISTRY – III

(2020 Admission)

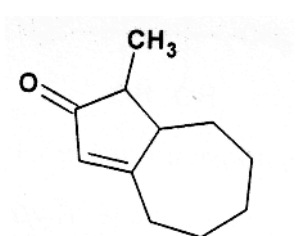
Time : 3 Hours

Max. Marks : 75

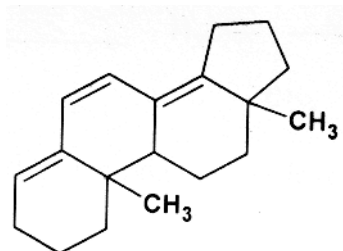
SECTION – A

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

1. (a) Using Woodward Fieser rule, calculate the λ_{\max} for the following compounds.



(i)



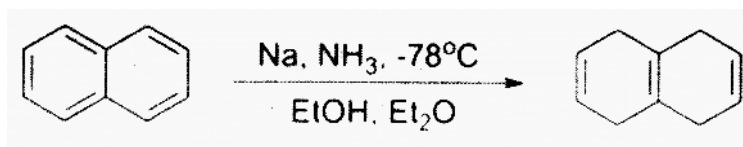
(ii)

- (b) How will you distinguish between ortho-nitrophenol and para-nitrophenol using IR spectroscopy?
- (c) What is the advantage of MALDI?
2. (a) What are the applications of NOE?
- (b) What is meant by double resonance?
- (c) Draw the $^1\text{H-NMR}$ spectrum of methyl benzoate.

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3. (a) What is Glaser coupling? Give one of its modifications.
 (b) Discuss the selectivity in Grignard's reactions.
 (c) Discuss one method of preparation of dialkyl cadmium compounds. Give any one of its reaction.
4. (a) What is Zimmerman traxler model?
 (b) What is olefin metathesis?
 (c) What is the importance of combinatorial chemistry?
5. (a) What is Jones oxidation? What is its mechanism?
 (b) Discuss the mechanism of the following reduction



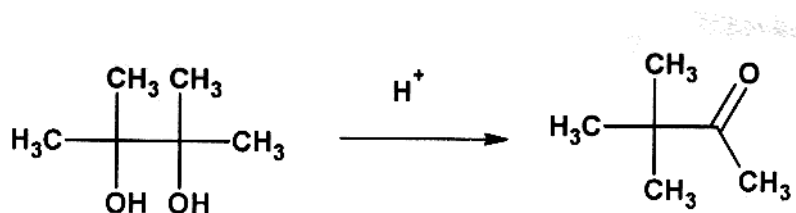
- (c) Discuss the Huang — Minlon modification to Wolff-Kishner reduction.

(10 × 2 = 20 Marks)

SECTION – B

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

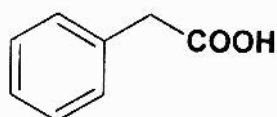
6. (a) Confirm the following conversion using Mass spectral fragmentation of the reactant and product :



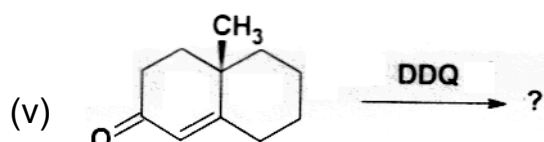
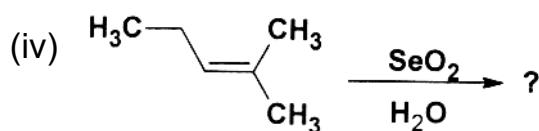
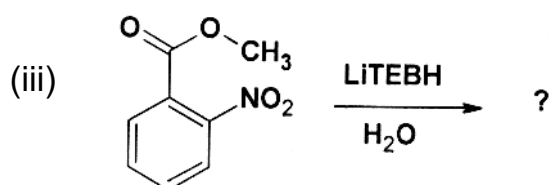
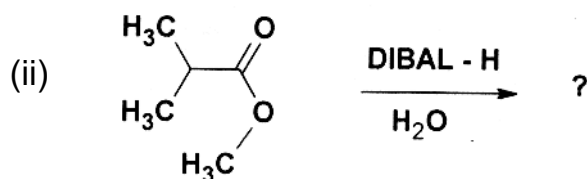
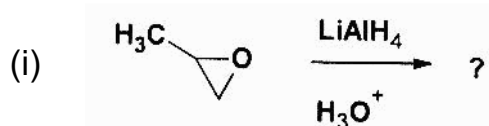
- (b) How can intermolecular and intramolecular hydrogen bonding be identified by IR spectroscopy?
7. (a) An organic compound with molecular formula $\text{C}_9\text{H}_{12}\text{O}_3$ shows the following peaks in $^1\text{H-NMR}$: 2.8 (6, s), 4.5 (3, s) and 7.8 (3, s) ppm. Sketch the structure.
 (b) Briefly explain the 2D-NMR techniques.



8. (a) What is Gilman Reagent? Give its structure and two of its reactions.
 (b) What is Peterson olefination? Discuss its mechanism.
9. (a) Explain the mechanism of Suzuki coupling
 (b) Discuss the retrosynthetic analysis of



10. (a) What are the advantages of using Boron as a reducing agent?
 (b) Sketch the products of the following reaction :



(5 × 5 = 25 Marks)



SECTION – C

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

11. (a) Discuss the various sampling techniques used in IR spectroscopy
(b) Sketch the structure of the compound using the following spectral data:
UV (nm): 256, 300; IR (cm^{-1}): 3030, 2930, 1720, 1510, 1490, 1420, 650;
Mass (m/e): 120 (M^+), 77, 43, 15.
12. Describe the reduction of styrene to ethyl benzene by $^1\text{H-NMR}$ spectroscopy. Pick out the specific peaks indicating the formation of the product.
13. Explain the synthesis and main name reactions of organozinc compounds
14. (a) What is Heck coupling? Explain its mechanism. What are its advantages?
(b) Explain the reaction mechanism and scope of benzoin condensation.
15. (a) What is Sommelet reaction? What is its mechanism?
(b) Compare the reduction behaviours of LiAlH_4 and NaBH_4 .

(3 × 10 = 30 Marks)

