



Reg. No. :

Name :

Third Semester M.Sc. Degree Examination, February 2019
Branch : Chemistry
CH/CL/CA/CM 232 : ORGANIC CHEMISTRY – III
(2016 Admission Onwards)

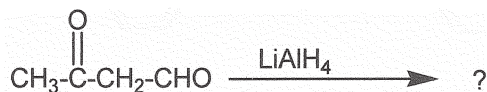
Time : 3 Hours

Max. Marks : 75

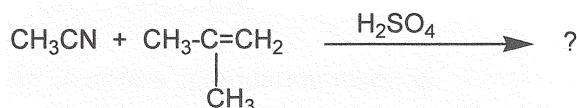
SECTION – A

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

1. a) Distinguish the following pair using IR spectroscopy.
Ethanol and acetone.
- b) Sketch the mass spectrum of $\text{CH}_3\text{CH}_2\text{Cl}$.
- c) What is meant by FAB ?
2. a) Write the splitting pattern of the following molecule in ^1H NMR :
 $\text{Cl} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{Br}$
- b) Define first order ^1H NMR spectra.
- c) Assign the structure of the compound of molecular formula C_5H_{12} which have only one ^1H NMR signal (0.9 ppm, 12H,s).
3. a) Predict the product(s) of the following reaction.



- b) Give an example for Pschorr reaction.
- c) Complete the following reaction.





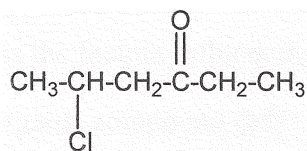
4. a) Define the term: Synthons.
 b) Give an example for Mitsunobu reaction.
 c) Suggest two reagents for protection of Thiols.
5. a) What is the application of supercritical CO₂ ?
 b) What are the detectors used in HPLC ?
 c) Give the principles of paper chromatography.

(10×2=20 Marks)

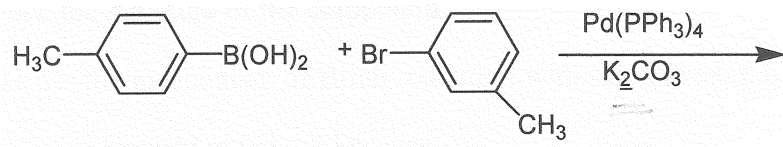
SECTION – B

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

6. a) Explain intramolecular and intermolecular hydrogen bonding using IR spectroscopy.
 b) Discuss MALDI technique with illustration.
7. a) Sketch the DEPT spectrum for the following compound :

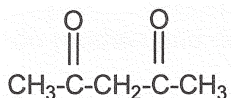


- b) Discuss HMBC NMR with suitable example.
8. a) Describe the mechanism of Wolff-Kishner reduction with an example.
 b) Predict the product and suggest a mechanism for the following.





9. a) Perform retrosynthetic analysis of the following compound :



b) Explain sharpless epoxidation reaction.

10. a) Describe the chiral separation using HPLC.

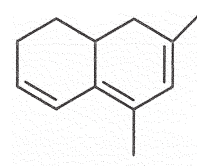
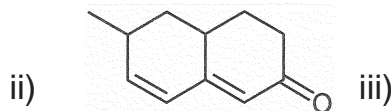
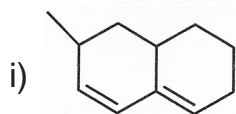
b) Explain Gel electrophoresis method and its application in separation.

(5×5=25 Marks)

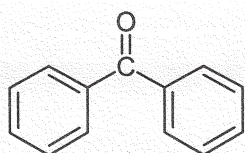
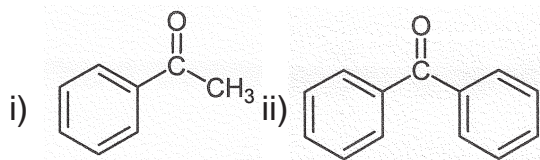
SECTION – C

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

11. i) Calculate λ_{\max} for the following compounds :



ii) Discuss the fragmentation of the following compounds in EI mass spectra.



12. i) Discuss the factors influencing chemical shift in ^1H NMR.

ii) An organic compound (MF : $\text{C}_9\text{H}_{10}\text{O}_2$) exhibits the following spectral data :

UV (λ_{\max}): 268, 264, 257 nm

IR : 1745, 1225, 749, 697 cm^{-1}

^1H NMR : 3.56 (3H, s), 2.8 (2H, s) and 7.22 (5H, m)

Deduce the structure of the compound.

13. i) Discuss the mechanism of Birch reduction with suitable examples.

ii) What is Negishi reaction ? Discuss.

14. i) Discuss electrochemical reduction of carbonyl group with suitable examples.

ii) How do you protect and deprotect carbonyl group ?



15. Explain the principle instrumentation and working of GC.

(3×10=30 Marks)