

COURSE CODE: 12B1WPY835

MAX. MARKS: 35

COURSE NAME: Analytical Techniques

COURSE CREDITS: 3

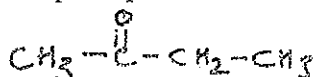
MAX. TIME: 2 HRS

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

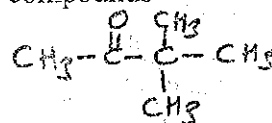
Q.1. Explain proton NMR spectra of following organic compounds

2 x 5 = 10

a.



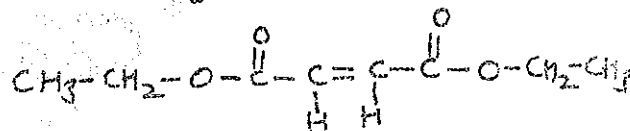
b.



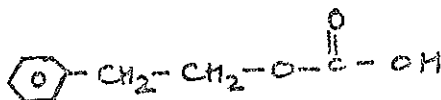
c.



d.



e.



Q.2. Answer the following:

2 x 3 = 6

- Differentiate between CW and FT method
- What is coupling constant? Write J-value for cis and trans propane.
- Explain origin of ^1H NMR spin-spin splitting.

Q.3. Explain instrumentation and working of mass spectrometer.

4

Q.4. Explain following (any two)

2 x 2 = 4

- McLafferty rearrangement
- Chemical ionization
- Metastable ions

Q.5. Why must mobile phases and all samples and standards be finely filtered before an GC experiment?

2

Q.6. Define the gradient elution method for HPLC, tell what instrument component is needed for it, and tell how this method is useful.

2

Q.7. What are three safety issues with regard to flame AA and how are they dealt with?

2

Q.8. What are the two important criteria for a successful separation by solvent extraction?

2

Q.9. What is different about the analytical strategy for instrumental analysis, compared to wet chemical analysis?

2

Q.10. Define calibration.

1