Sl. No.	:	6147
Unique Paper Code	:	1141302
Name of the Paper	:	Polymer Characterization
Name of the Course	:	B.Tech (Polymer Science)
Semester	:	III
Duration	:	3 Hours
Maximum Marks	:	75 Marks.

F-5

Instruction for candidates

(Write your Roll no. on the top immediately on receipt of the question paper.)
Attempt five questions in all.
Question No. 1 is compulsory.Draw neat and labeled diagram wherever necessary.

Q.No.1a. Explain advantageous feature of spectral method of analysis.
b. Explain why H_2O is IR active but O_2 is inactive?
C. What is Retention factor ? How it can be measure by paper chromatography.
d. Write a note on chemical ionization in mass spectroscopy
e. Explain the Chemical shift in NMR spectroscopy.
f. Explain the role of coating on polymer sample before taking SEM images
g. Crystallinity and permeability are interdependent properties. Justify
h. Differentiate precision and accuracy.
i. Calculate no. of modes of vibration in ethane. (3x9)

Q.No.2:Explain the working Principle, Instrumentation and Application in polymer testing of IR spectroscopy.
b. The absorbance of $3.5X10^{-4}$ M solution of PVC at 1600 nm is 0.40. When measured in a cell with 1cm path length . Calculate the molar absorbance coefficient. (8,4)

Q. No. 3.What is NMR spectroscopy? Explain the principle and application of NMR in polymer characterization.
b. Calculate the no of peaks observed in 1H NMR spectra for following monomer: Phenol, MMA, Aniline and Adipic acid. (8,4)

Q.No.4. a. Discuss the chromatographic analysis with emphasis on HPLC and its uses.
b. Explain the procedure of measuring amorphous characteristic of a polymer. (8,4)

Q.No.5. Explain the measuring procedure of Haze and gloss nature of a polymer
b. Describe the application of U.V. spectroscopy in polymer characterization. (6,6)

Q.No.6: Explain the principle and application of mass spectrometer in polymer charactersation
b. The benzene radical anion $C_6H_6^-$ has a g value 2.0025. At what field would you reach for resonance in a spectrometer operating at (a) 9.302GHz (b) 33.67GHz?

Q.No.7: Write short notes on any three:
a. Frank-Condon Principle
b. Yellowness index
c. Thin layer chromatography
f. X-ray Diffraction (4x3)