

M.Tech. First Semester (Membrane & Separation Tech.) (F.T.)
13025 : Chemical Engineering Analysis : Paper 1 MST 3

P. Pages : 1

Time : Three Hours



AU - 3268

Max. Marks : 80

- Notes :
1. All question carry marks as indicated
 2. Answer **any six** questions.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Diagrams and chemical equations should be given wherever necessary.
 6. Illustrate your answer necessary with the help of neat sketches.
 7. Use of pen Blue/Black ink/refill only for writing the answer book.

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|-----|----|---|---|
| 1. | a) | What is the principle of Atomic absorption spectroscopy? What are the different sources of interference in this technique? | 7 |
| | b) | What are the essential requirements of a burner for atomic absorption. | 7 |
| 2. | a) | Explain construction details of detectors used in infrared spectroscopy? | 7 |
| | b) | Give an account of fingerprint region and functional group region of IR spectrum. | 6 |
| 3. | a) | Describe the schematic diagram of HPLC and describe the functioning of each components? | 7 |
| | b) | Explain NMR spectroscopy? What is meant by chemical shift in NMR spectroscopy? | 7 |
| 4. | a) | describe the construction of a typical mass spectrograph. | 7 |
| | b) | What are the various types of mass spectrometers in used. | 6 |
| 5. | a) | Give an account of various types of adsorbents in column chromatography. | 7 |
| | b) | What is the principle of calorimetric analysis. | 6 |
| 6. | a) | Draw a brief outline of a typical visible spectrophotometer. | 7 |
| | b) | Explain fundamental Laws of Photometry. | 6 |
| 7. | a) | Highlight difference between column chromatography, Partition chromatography and paper chromatography. | 7 |
| | b) | Explain electron capture detector in gas chromatography. | 6 |
| 8. | a) | What are the various types of column chromatography used in practice. | 7 |
| | b) | Discuss the application of computer in chemical analysis. | 6 |
| 9. | a) | Highlight the importance both thermal conductivity and flame ionization detector in gas chromatography. | 7 |
| | b) | A compound gives a mass spectrum with peak light at $m/z = 77$ (40%) 112 (100%), 114(33%) and essentially no other peaks observed. Identify compound? | 6 |
| 10. | a) | Explain ion exchange chromatography. | 7 |
| | b) | Explain R_f value in liquid chromatography. | 6 |
