B. Tech.
(SEM. VIII) EXAMINATION, 2006-07
INSTRUMENTATION IN COATING INDUSTRY

Time : 3 Hours] [Total Marks : 100

Note : (1) Attempt all questions.
(2) All questions carry equal marks.

1 Attempt any two of the following questions:
   (a) Explain the underlying principle involved in the gas liquid chromatography, based on a suitable example
   (b) Describe how you would analyse a vegetable oil by Thin Layer Chromatography.
   (c) Discuss merits and limitations of HPLC for the analysis of monomers, solvents and plasticizers.

2 Attempt any two of the following questions:
   (a) What is the importance of microscopical examination of coating films? Describe how coatings/films are examined microscopically in industry.

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(b) Establish the superiority of Scanning Electron Microscopy over other similar techniques used in industry for analysis of coating materials.

(c) What is NIR spectroscopy? Discuss the scope of its application in coating industry.

3 Attempt any two of the following questions:

(a) Describe how you would characterize solid resins by using FTIR spectrophotometer.

(b) Discuss elaborately the theory and practical applications of Internal Reflection Spectroscopy.

(c) Compare IR with NIR spectroscopic analysis.

4 Discuss/Describe any two of the following:

(a) NMR equation, and relaxation.

(b) Construction of NMR instrument

(c) Characterization of oxygenated and chlorinated solvents by NMR.

5 Attempt any two of the following questions:

(a) How would you test a coating film by X-ray diffraction techniques?

(b) Comment on the statement: "For effective research and development work in paint industry, use of latest computers is a must."

(c) Discuss the use of computer in tailor-making of resins/polymers.