

M.TECH. (I.E.E.), Examination 2019
(1st Year, 2nd Semester)
Instrumental Analysis

Time: Three Hours

Full Marks: 100

Answer any five questions

1. a) Explain the following terms in connection with gas chromatography:
 - i) Chromatogram
 - ii) Stationary phase and mobile phaseb) Draw and explain the different parts of a gas chromatography.

4+16
2. Discuss the theory of Raman spectroscopy. Give a block diagram of Raman spectrometer and identify the components. Write a note on the application of Raman spectrometry.

6+7+7
3. a) Discuss the working principle of a voltammetry instrument.
b) Define the following terms:
 - i) Cyclic voltammetry and ii) Pulse voltammetry

14+6
4. Draw the block diagram of an NMR spectrometer. Explain the function of each part and explain how it is used to obtain NMR spectra. How are these spectra useful?

8+10+2
5. What is a spectrophotometer? Explain a typical UV/ visible spectrometer using double beam.

20
6. Explain the basic principles involved in potentiometry. With suitable diagram explain pH measurements using a glass electrode.

8+12
7. Write short notes on any two of the followings:

2x10

 - a) HPLC
 - b) Near infrared spectrometer
 - c) DAQ