Code No: RR411001 **Set No.1**

IV B.Tech. I Semester Regular Examinations, November -2005
ANALYTICAL INSTRUMENTATION
(Electronics & Instrumentation Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) With schematic diagram explain the beat frequency method for measuring conductivity.
   (b) Draw and explain the equivalent circuit of the conductivity cell when used in high frequency methods. [10+6]
2. (a) Explain the constructional details of sodium analyzer.
   (b) Discuss the various principles used in sodium analyzer. [8+8]
3. Explain the principle of operation of thermal conductivity analyzer used for estimation of components such as CO, CO_2 etc. [16]
4. Explain in detail sample injection system in chromatography? [16]
5. (a) Distinguish between photodiode array detector and diode array detector.
   (b) Give a schematic and explain the multi-channel spectrophotometer. [8+8]
6. (a) Explain the operation of multi channel type instrument to calculate focal length of a monochromator.
   (b) If the order used in an echelle grating is 70 and a dispersion angle 60^0, groove density 80/mm and focal length 0.5 m, Obtain the reciprocal linear dispersion and resolution. [6+10]
7. (a) Write down the needs of mass Spectrometer.
   (b) Discuss the merits of various types of mass Spectrometer. [8+8]
8. (a) Draw the schematic of Geiger counter and explain the principle of operation .
   (b) Describe with a neat sketch the constructional details and application of a proportional counter. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR411001 **Set No.2**

IV B.Tech. I Semester Regular Examinations, November -2005
ANALYTICAL INSTRUMENTATION
(Electronics & Instrumentation Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) With neat schematic explain the working principle of Beckman zeromatic pH meter.
   (b) Discuss the temperature compensation arrangement in direct reading type pH meter. [8+8]
2. (a) With neat block diagram explain any one type of sodium analyzer.
   (b) Write short notes on clinical sodium analyzer. [10+6]
3. Describe the principle of operation of infrared gas analyzer. [16]
4. Discuss the quantitative analysis of chromatography system? [16]
5. (a) Briefly explain how do you classify spectroscopic analysis techniques.
   (b) Explain the scheme of a non dispersive dual channel absorption type IR spectrometer. [8+8]
6. (a) Briefly explain the double beam type atomic absorption spectroscope with a block diagram.
   (b) Briefly discuss about the detectors. [8+8]
7. Write brief notes on:
   (a) Fourier Transform NMR Spectroscopy.
   (b) Use of computers with NMR Spectroscopy. [8+8]
8. Write short notes on
   (a) Ionization chamber.
   (b) Solid state detectors. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR411001 **Set No.3**

IV B.Tech. I Semester Regular Examinations, November -2005
ANALYTICAL INSTRUMENTATION
(Electronics & Instrumentation Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. With neat sketches explain the various methods for the measurement of electrolytic conductance. [16]
2. (a) Explain the constructional details of sodium analyzer.
   (b) Discuss the various principles used in sodium analyzer. [8+8]
3. How co laser can be used for the measurement of nitric oxide. Give a neat block diagram and explain the operation of each block clearly. [16]
4. Explain in detail the solvent delivery system for liquid chromatography? [16]
5. (a) Distinguish between calorimeters and photometers.
   (b) Briefly explain the absorption spectrometer for visible range using single beam approach. [8+8]
6. (a) Explain briefly about flame photometry?
   (b) Briefly discuss about the detectors of flame photometry? [8+8]
7. (a) How will you calculate Resolution of mass spectrometer?
   (b) What is the need of utilizing vaccum system in mass spectrometer? [8+8]
8. (a) Draw the schematic of Geiger counter and explain the principle of operation .
   (b) Describe with a neat sketch the constructional details and application of a proportional counter. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR411001 **Set No.4**

IV B.Tech. I Semester Regular Examinations, November -2005
ANALYTICAL INSTRUMENTATION
(Electronics & Instrumentation Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. With neat sketches explain the various methods for the measurement of electrolytic conductance. [16]

2. (a) With neat block diagram explain any one type of sodium analyzer.
   (b) Write short notes on clinical sodium analyzer. [10+6]

3. Compare and list out the merits and demerits of non-dispersive infrared analyzer over gas chromatography in carbon monoxide estimation. [16]

4. (a) With neat sketches, explain with detail infrared detector used in liquid chromatography system.
   (b) With neat sketches, explain with detail electrochemical detector used in liquid chromatography system. [8+8]

5. (a) Signal to noise ratio can be improved by specially designed filters - What are these Filters?
   (b) How do they improve the ratio? [6+10]

6. (a) Explain briefly about an atomic absorption Spectroscope.
   (b) What are the problems of AAS? [8+8]

7. (a) Explain about the general principle of operation of a mass Spectrometer with neat diagram.
   (b) With needed schematic diagram, explain about magnetic mass Spectrometer. [8+8]

8. (a) Draw the schematic of Geiger counter and explain the principle of operation .
   (b) Describe with a neat sketch the constructional details and application of a proportional counter. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆