Code No: 07A71001 **R07** **Set No. 2**

IV B.Tech I Semester Examinations,November 2010
ANALYTICAL INSTRUMENTATION
Electronics And Instrumentation Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Define Chromatography. Explain the principles of Gas Chromatography and Liquid Chromatography. Name two applications of each. [16]

2. Mention the drawback of Null method for Conductivity measurement. Explain Direct reading method and how it overcomes the problem? [16]

3. (a) Write short notes on
   i. Classification of gas analyzers
   ii. Applications of gas analysers with examples.
   (b) Explain the principle of operation of Thermal Conductivity analyzer used for the estimation of components such as CO, CO_2 etc. [8+8]

4. (a) What are the sources of error in spectrophotometric measurements? Explain.
   (b) Explain briefly the derivative technique used for a recording prism spectrophotometer with the calibration method. [6+10]

5. Can we use the Paramagnetic Analyzer to analyze all the gases which exhibit paramagnetic property? Justify your answer. [16]

6. (a) Write about the fuel system of flame photometers.
   (b) Why is source modulation employed in atomic absorption spectroscopy. [8+8]

7. Write short notes on:
   (a) Resonance conditions in NMR.
   (b) NMR absorption spectra.
   (c) Radio- frequency transmitter and receiver. [3+3+10]

8. (a) Distinguish between the GM counter and the proportional counter.
   (b) Discuss about the pulse height analyzer. [8+8]

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Code No: 07A71001 **R07** **Set No. 4**

IV B.Tech I Semester Examinations,November 2010
ANALYTICAL INSTRUMENTATION
Electronics And Instrumentation Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe Constant Pressure Pumps type of mobile phase delivery system with figure
   (b) What are the limitations of FID? How these are overcome in DFID? [8+8]
2. Explain in detail about the signal amplifier and the detector circuit used in NMR with diagram. [16]
3. Explain Katharometer dissolved Oxygen meter with neat diagram. [16]
4. Briefly discuss
   (a) Relative Thermal Conductivity of different gases.
   (b) IR Gas Analyzer FOR Hydrocarbon detection. [6+10]
5. (a) State the relation between concentration and absorbance .
   (b) What are the advantages of flame photometry?
   (c) Explain briefly the principle of flame photometry. [4+4+8]
6. (a) Give the applications of the GM counter.
   (b) State and explain the principle of the ionizing chamber. [8+8]
7. Give the differences between
   (a) Spectrophotometers and photometers
   (b) Single and double beam instruments for absorbance measurement.
   (c) Phototubes and photomultiplier tubes.
   (d) Conventional and diode-array spectrophotometers. [16]
8. (a) Explain the principle of operation of Chopper Amplifier type of pH meter with neat figure.
   (b) Explain about Hydrogen Purity meter by using Thermal Conductivity method. [8+8]

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Code No: 07A71001 **R07** **Set No. 1**

IV B.Tech I Semester Examinations,November 2010
ANALYTICAL INSTRUMENTATION
Electronics And Instrumentation Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Discuss the variation of count rate with voltage using suitable counter.
   (b) What is the dead time of the counter? Explain. [10+6]
2. (a) Discuss the calibration method adopted for IR spectrometer.
   (b) Give the advantages of FT spectroscopic technique. [8+8]
3. With a neat block diagram explain the basic parts of gas Chromatograph. [16]
4. (a) Name the basic components of Analytical instruments and explain them.
   (b) Analytical instruments based on Beer's law make use of Optical filters. What are these Optical filters? Name the types and explain. [8+8]
5. Explain in detail about the modulation unit used in electron spin resonance. [16]
6. Explain Electrochemical dissolved Oxygen meter. [16]
7. (a) With neat schematic explain Null detector type pH meter using an Electrometer tube.
   (b) Draw and explain the method which measures conductivity by measuring Resistance of the solution. [8+8]
8. Explain the different types of infrared spectrophotometers with necessary diagrams. [16]

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Code No: 07A71001 **R07** **Set No. 3**

IV B.Tech I Semester Examinations,November 2010
ANALYTICAL INSTRUMENTATION
Electronics And Instrumentation Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Draw and explain Beckman Zeromatic pH meter. What is the main advantage associated with it. [16]

2. (a) Draw the block diagram of atomic absorption spectrophotometer and briefly explain the various parts of it.
   (b) Write short notes on the optical system used in flame photometry. [12+4]

3. (a) Explain in detail with necessary diagram the Echellette grating.
   (b) Write short notes on holographic gratings. [8+8]

4. (a) What are the problems associated with IR Gas Analyzer. How these problems are overcome?
   (b) List out the differences between the conventional IR gas analyzer and its improved version. Briefly discuss the improved version of IR gas analyzer. [8+8]

5. (a) Sketch the components of a Gas Chromatography.
   (b) Discuss the types of applications in which gas Chromatography is particularly useful. [8+8]

6. (a) What is the basic difference of Electrochemical Oxygen analysis from other methods. State and explain the principle.
   (b) What are the different applications of Oxygen analyzers? [8+8]

7. Explain in detail the construction and working principle of any two types of radiation detectors with a neat diagram. [16]

8. (a) What is a frequency lock system in an NMR spectrometry? Describe the two types of lock systems.
   (b) In NMR spectroscopy how are signals converted to the audio frequency range? [8+8]

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