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Total number of printed pages – 2

B. Tech
PEEI 5301

Sixth Semester Back Examination – 2015

ANALYTICAL INSTRUMENTATION

BRANCH : AEIE

QUESTION CODE : M 376

Full Marks – 70

Time : 3 Hours



*Answer Question No. 1 which is compulsory and any five from the rest.
The figures in the right-hand margin indicate marks.*

1. Answer the following questions : 2 × 10
 - (a) Write few advantages of using Intelligent Analytical Instrumentation system.
 - (b) Write basic principle of Absorption Spectroscopy.
 - (c) What is the purpose of using Monochromator in Infrared Spectrophotometer ?
 - (d) List any TWO Photo-Sensitive Detectors used in Flame Photometer.
 - (e) Distinguish between Qualitative and Quantitative measurement.
 - (f) List various types of Liquid Chromatography.
 - (g) Write the range of blood pH value of a healthy person.
 - (h) List various types of NMR Spectrometers.
 - (i) Write the expression of Half-Life period of Radioactive Isotopes.
 - (j) Write few characteristics of X-ray useful for designing X-ray Spectrometer.
2.
 - (a) Describe roles / functions of various elements of an Analytical Instrumentation System. 5
 - (b) Draw schematic diagram of a Photometer and explain its operation. 5

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3. (a) Describe construction and principle of operation of any ONE type Infrared Spectrophotometer. 5
- (b) Describe essential parts of a Flame Photometer and explain its operation. 5
4. (a) Describe functions of various parts of a Gas Chromatograph. 5
- (b) With suitable diagram explain construction and principle of operation of any ONE Liquid Chromatograph. 5
5. (a) With suitable diagram explain measurement of blood pH. 5
- (b) Explain measurement of blood Partial Pressure of Carbon Dioxide. 5
6. (a) Explain basic principle of NMR Spectrometer. 5
- (b) Describe construction and principle of operation of any ONE Radiation Detector. 5
7. (a) List the components and explain their functions associated with X-ray Spectrometers Instrumentation System. 5
- (b) Explain construction and basic principle of operation of X-ray Diffractometer. 5
8. Write Short Notes any **two** of the following : 5×2
- (a) Describe construction and principle of operation of Atomic Absorption Spectrophotometer.
- (b) Describe construction and principle of operation of of Paramagnetic Oxygen Analyzer.
- (c) Write various units (dimensions) used for expressing Radioactivity and explain properties of particles emitted in radioactive decay.

