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53 (IE 505) ANIN

2014

## ANALYTICAL INSTRUMENTATION

Paper : IE 505

Full Marks : 100

Pass Marks : 30

Time : Three hours

**The figures in the margin indicate full marks for the questions.**

Answer **any five** questions out of seven.

1. (a) Draw and explain the Block diagram of liquid chromatography? 10
- (b) Distinguish between Gas-chromatography and liquid chromatography. 5
- (c) What are the advantages of gas chromatography? 5
2. (a) Explain about IR spectroscopy and give the basic components of IR spectrometer? 15

Contd..

- (b) Give some applications of IR Spectrometer ? 5
3. (a) What are the Mechanical hygrometers ?  
Explain *any one* with neat sketch. 10
- (b) Write short note on Biosensor with suitable example. 10
4. (a) What is *pH* measurement and derive NERNST Equation ? 10
- (b) Briefly explain the basic elements of Analytical instruments ? 10
5. (a) Explain the construction and working principle of X-Ray Tube. 10
- (b) What is Mass spectrometer ? Give its type and components. 10
6. (a) Define the term gas analyser. Explain it with *two* examples. 10
- (b) How the dissolved oxygen can be measured and explain *two* suitable methods for it? 10

7. Write short note on the following :  $4 \times 5 = 20$

- (a) Thermal conductivity method
- (b) Flame ionization detector
- (c) Nuclear Magnetic Resonance
- (d) X-ray spectroscopy.