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53 (IE 505) ANIN

2017

ANALYTICAL INSTRUMENTATION

Paper : IE 505

Full Marks : 100

Time : Three hours

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

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

1. (a) With a neat diagram, explain the following : 2×7=14
 - (i) Double beam photometer
 - (ii) Flame photometer.

- (b) With a block diagram, explain chromatography. 6

2. (a) Explain sulphur and hydrocarbon detectors in gas chromatography. 14

Contd.

- (b) Explain the following principle of operations in gas chromatography : 6
- (i) Adsorption
 - (ii) Gel permeation
 - (iii) Ion-exchange.
3. (a) Explain *any two* types of NH_3 analyzer. 14
- (b) With a neat diagram, explain the working of nitrogen meter. 6
4. Explain a technique for measuring following gases in air : 20
- (i) Hydrocarbon
 - (ii) Carbon monoxide
 - (iii) Sulphur dioxide.
5. Explain the following mass spectrometers : 20
- (i) Quadrupole
 - (ii) Time-of-flight
 - (iii) Magnetic deflection.

6. (a) Explain Calomel electrode. 4
(b) Explain HPLC. 8
(c) Explain UV-Visible spectrophotometric detector in liquid chromatography. 8
7. Write short notes on : 4×5=20
(a) Digital pH meter
(b) Biosensor
(c) PMT
(d) Ion selective electrodes.
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