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53 (IE 505) ANIN

2021

**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. With neat diagram, explain the following :
  - (a) Absorption Instrument. 6
  - (b) Double beam photometer. 6
  - (c) Atomic absorption spectrophotometer. 8
2. (a) Explain the universal detector used in GC. 6

Contd.

- (b) Explain LC detector using the following techniques :  $7 \times 2 = 14$
- (i) Absorption
- (ii) Fluorescence.
3. Explain *any three* types of gas analyzer. 20
4. Explain *any three* techniques for identification of different molecules in a complex mixture according to their mass/charge ratio. 20
5. (a) Explain ISE and its types. 8
- (b) Explain the technique to measure hydrogen ion concentration in urine. 8
- (c) Explain biosensor. 4
6. Explain *any three* techniques for measuring  $\text{SO}_2$  in air. 20
7. Explain the following :
- (a) Geiger-Müller Counter. 8
- (b) GC sample injectors. 6
- (c) Chromatography Column. 6

