

(3 Hours)

[Total Marks : 80

N.B. (1), Question No.1 is Compulsory.

(2) Attempt any three questions remaining four Questions.

(3) Figures to the right indicates full marks.

Q.1. Attempt any five:-

- Draw the general block diagram of analytical instruments and explain.
- Describe the radiation sources used in IR spectrophotometers.
- Define chemical shift and explain its significance in NMR spectrometry.
- State Beers and Lambert's Law.
- Give the list of components of mass spectrometers. Explain in brief the principle of mass spectrometry.
- What are the units of radioactivity. Explain half life period.

Q.2 a) With a neat block diagram explain an atomic absorption spectrophotometer. (10)

b) When does nuclear magnetic resonance occur. Explain the working of NMR spectrometer (10)

Q.3a) Explain with a schematic diagram the operation of a double beam UV Spectrometer (10)

b) Explain Time of flight mass spectrometer with neat diagram. (10)

Q.4 a) Explain the basic components of instrumentation for X-ray spectroscopy with a diagram (10)

b) Give classification of chromatograph. List the parts of GC. Draw and explain the working of GC. (10)

Q.5 a) Explain the principle and working of Scintillation counter (10)

b) With neat diagram explain paramagnetic oxygen analyzer (10)

Q.6 Write short notes on (any two):- (20)

- ESR
 - Infrared gas analyzer
 - GC-MS
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