

Choice Based

(3 Hours)

[Total Marks: 80]

- N.B: (1) Question No. 1 is compulsory.  
(2) Attempt any **Three** questions from remaining.  
(3) Figures to the right indicate full marks.

1. Answer the following: -

[20]

- (a) Explain the causes for deviation from Beer's law.
- (b) Calculate the energy of 530 nm photon of visible radiation.
- (c) Explain Time decay of radioactive isotopes.
- (d) Explain the principle of Raman Spectroscopy.

2. (a) With neat diagram, explain double beam spectrophotometer.

[10]

(b) Explain the differences between AAS and AES.

[10]

3. (a) With neat diagram, explain the working of ionisation chamber.

[10]

(b) Explain CO<sub>2</sub> analyser with neat diagram.

[10]

4. (a) With neat diagram, explain NMR Spectrometer.

[10]

(b) With a neat sketch explain working of a high-pressure liquid chromatography.

[10]

5. (a) Explain the concept of Fluorescence and Phosphorescence.

Also explain the working of single beam filter fluorimeter with neat diagram.

[10]

(b) Explain the sample handling techniques for solids and liquids in Mass Spectrometer.

[10]

6. Write Short Note on: - [Any Two]

[20]

(a) Gas Chromatograph.

(b) Photomultiplier Tube.

(c) Sources used in Spectrophotometers.

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