

315354

12526

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--

-
- Instructions* – (1) All Questions are *Compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following :** **10**
- a) Define analytical instrumentation.
- b) Distinguish in between Electro-analytical and spectral method in analytical instrumentation.
- c) Explain the use of Filters and Monochromators with suitable examples.
- d) Classify chromatography.
- e) State the working principle of pH electrode with example.
- f) Draw the labeled diagram of glass electrode.
- g) Explain following terms –
- i) Volumetric
- ii) Gravimetric with equation. For representation of concentration of gases.

P.T.O.

- 2. Attempt any THREE of the following : 12**
- Describe properties of analytes and techniques used in analytical instruments.
 - State Lambert's law and Beer's law with suitable equation.
 - Differentiate in between Gas Chromatography and Liquid chromatography. (Any four points)
 - Describe the working principle of paramagnetic oxygen analyzer with suitable diagram.
- 3. Attempt any THREE of the following : 12**
- Explain interaction of radiation with matter with labeled diagram.
 - Define the following terms.
 - HPLC
 - Time of flight in mass spectrometer.
 - Define the following terms –
 - Basics and process
 - Standard operating process in sample handling system.
 - Illustrate conductivity meter with process diagram and example.
- 4. Attempt any THREE of the following : 12**
- Describe the functions of analytical instrumentation with block diagram.
 - Compare colorimeter and spectrophotometer. (Any four points)
 - Explain working principle of mass-spectrometer with suitable diagram.
 - Differentiate in between thermal conductivity analyzer and IR gas analyzer. (Any four points)
 - Explain with diagram any one method for measurement of Nitrogen Oxides.

5. Attempt any TWO of the following : 12

- a) Differentiate in between single beam filter photometer and double beam filter photometer. (Any six points)
- b) Define the following terms –
 - i) Mechanism of separation
 - ii) Types of mobile phase
 - iii) Shape of chromatography bed
- c) Illustrate blood gas analyzer with it's block diagram and suitable example.

6. Attempt any TWO of the following : 12

- a) Compare GCMS and LCMS. (Any six points)
 - b) Explain calomel electrode working with labeled diagram.
 - c) Illustrate Gas chromatography technique for measurement of gas pollutant with figure and proper example.
-