

22435

11920

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.

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| 1. Attempt any FIVE of the following : | 10 |
| (a) Define the photometry laws. | |
| (b) State the meaning of sterilization. | |
| (c) List any four parts of Transmission Electron Microscope (TEM). | |
| (d) Draw a neat labelled diagram for measuring conductivity using direct method. | |
| (e) Draw a neat labelled diagram of non-dispersive infrared analyzer for sulphur dioxide. | |
| (f) Draw a neat labelled diagram of flame photometer. | |
| (g) List any two sensors used for measurement of conductivity. | |
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| 2. Attempt any THREE of the following : | 12 |
| (a) Draw the neat labelled diagram of colorimeter and state function of each parameter. | |
| (b) Describe construction and working principle of autoclave with a neat labelled diagram. | |
| (c) Draw diagram of electro-conductive blood cell counter. | |
| (d) Following are the full scale measurement range for various gas pollutant. Suggest measurement technique for following pollutants : | |
| (i) Carbon monoxide – 0 - 50 ppm | |
| (ii) Hydrocarbons – 0 - 80 ppm | |
| (iii) Sulphar oxide – 0 - 2 ppm | |
| (iv) Nitrogen oxide – 0 - 1 ppm | |

- 3. Attempt any THREE of the following : 12**
- (a) Draw incinerator with neat labelled diagram and describe its working principle.
 - (b) Describe the working of gas chromatography with neat diagram and list two applications of it.
 - (c) Draw labelled diagram for inductive conductivity sensor for measuring conductivity and give its working.
 - (d) List any four gas pollutants present in atmosphere and write its effect on health (one effect of each pollutants).
- 4. Attempt any THREE of the following : 12**
- (a) Draw a neat labelled block diagram of analytical instruments. State the function of each block.
 - (b) With neat diagram describe working principle of analytical ultracentrifuge.
 - (c) Describe the working principle of dark field blood cell counter with neat diagram.
 - (d) Explain the working of transmission electron microscope with neat diagram.
 - (e) Describe the pollution monitoring station and explain.
- 5. Attempt any TWO of the following : 12**
- (a) Is autoanalyzer instrument is based on photometry law ? Justify your answer. Draw the neat labelled diagram of auto-analyzer and list its application
 - (b) Draw labelled diagram of ultrasonic cleaner. Describe its working. List any two applications of same.
 - (c) Suggest the technique for separating ions or charged molecules that are dissolved in solvent and explain it with neat diagram.
- 6. Attempt any TWO of the following : 12**
- (a) State two applications of following analytical equipment :
 - (i) Auto analyzer
 - (ii) Colorimeter
 - (iii) Spectrophotometer
 - (b) Write significance of temperature compensation of conductivity measurement and describe its working.
 - (c) Draw the equivalent circuit diagram of conductivity cell and describe its working.
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