

B.E. Instrumentation Engineering (Model Curriculum) Semester-VIII  
**IN801M - Analytical and Environmental Instrumentation**

P. Pages : 2

Time : Three Hours



**GUG/W/23/14363**

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
  2. Assume suitable data wherever necessary.
  3. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Write a short note on **any two**. 8
- a) Radiation sources.
  - b) Optical fibers
  - c) Monochromators.

- b) Compare in between classical method and instrumental analysis method. 8

**OR**

2. a) Draw and explain the various components of an absorption instruments. 8

- b) Define Beer-Lambert law and state the deviations from Beer-lambert law. 8

3. a) Draw & explain the working of single & double beam filter photometer. 8

- b) Discuss UV-visible spectrophotometer with the help of 8
- i) Working principle
  - ii) Construction

**OR**

4. a) Discuss the applications of Atomic absorption spectrophotometer. 8

- b) Describe the working principle of flame photometer with application. 8

5. a) Draw and explain the basic parts of a gas chromatograph in brief. 8

- b) Describe the strategy to separate sample in HPLC with a neat instrumentation diagram. 8

**OR**

6. a) Describe with block diagram the working of Liquid chromatograph. 8

- b) Enlist various detectors used in gas chromatograph and explain any two in detail. 8

7. a) With a schematic diagram explain the method of measuring Sulphur dioxide (SO<sub>2</sub>) estimation using conductivity method. 8

- b) Discuss how to estimate the amount of hydrocarbons present in air with neat instrumentation set up. 8

**OR**

8. a) Classify types of gas analyzer for measurement of oxygen and explain any one in detail. 8
- b) What are the different electrochemical methods of oxygen measurements. 8
9. a) List different types of electrodes used for measurement of pH. Discuss any two electrodes in details. 8
- b) Elaborate the principle and schematic diagram of a biosensor in details. 8

**OR**

10. a) Elaborate non-contact type water conductivity meter. 8
- b) Discuss how dissolved oxygen in water can be measured. 8

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