BTEINE605A: Analytical Instruments

Unit-I:

1. Define wavelength.
2. Draw schematic representation of Electromagnetic spectrum.
3. State the names of sources required for ultraviolet and visible light spectrum.
4. What do you mean by chromatogram and draw typical chromatogram?
5. Draw classification chart of chromatography
6. Define chromatography
7. State and explain Beer-Lambert's law
8. Enlist the detectors used in IR spectroscopy
9. Draw neat diagram of flame photometer
10. Draw and explain Beckman model spectrophotometer
11. Draw neat schematic of Gas chromatograph and explain it.

Unit-II:

1.What is the basic principle of chromatography?

2. List different types of Chromatography techniques.

3. Draw typical chromatogram. Explain it.

4. Draw and Explain GC with neat schematic.

5. Explain in short different Liquid chromatographic techniques

6. What do you mean by HPLC?

7. Explain HPLC column with neat diagram.

8. Which reference gas is used in gas chromatography carrier system.

9. Explain sample injection system in GC.

10. Explain sources detectors in HPLC

Unit-III&IV:

1. Enlist the gas pollutant available in air.
2. Enlist Types of gas analyzer.
3. Show thermal conductivity of different gases using bar graph.
4. State importance of gas analyzer.
5. Draw magnetism graph for different gases.
6. Draw and Explain O2 gas analyzer.
7. Draw and Explain IR gas analyzer.
8. Draw and Explain ionization-based gas analyzer.
9. Draw and Explain Thermal conductivity gas analyzer.
10. What is air quality index?
11. Explain NO2 analyzer with neat diagram.
12. Draw and Explain smoke and dust measurement system.
13. Explain effects of following gases on air.

a. Sulphur dioxide

b. Carbon monoxide

c. H2S hydrogen Sulphide

d. Hydrocarbons

Unit-V:

1. Define pH.
2. State and Explain pH measurement principle
3. Explain pH scale in short.
4. Enlist different pH reference electrodes.
5. Draw and explain construction of glass electrode used for pHmeasurement.
6. Draw and explain construction of calamole electrode used for pHmeasurement.
7. Draw and explain construction of Ag/AgCl electrode used for pHmeasurement.
8. Draw and explain construction of selective ion electrodes

9. What do you mean by biosensor? Explain with neat schematic.
10. Explain principle working of biosensors.
11. Write a short note on ammonia electrode.
12. Write a short note on Sodium analyzer.

Unit-VI:

1. What is the basic principle of NMR spectroscopy?
2. Enlist different applications of NMR spectrophotometer.
3. Draw and explain block diagram of NMR spectrophotometer.
4. What are different types of NMR spectrophotometer?
5. Explain TEM with principle.
6. Explain SEM with principle.
7. What is Mass spectroscopy?
8. Draw and explain block diagram of mass spectrophotometer.
9. Explain applications of mass spectroscopy.