

2023

ANALYTICAL INSTRUMENTATION

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

Answer any five questions

1. a) With a neat diagram, explain the working of an absorption instrument. 6  
b) Explain the gas analyzer based on gas density. 6  
c) With a neat diagram, explain the working of an UV-Visible Spectrophotometric detector used in HPLC. 8
2. a) Explain FPD, PID and TCD used in GC. 20
3. a) Name a technique to detect CO pollutant in air. With a neat diagram, explain its working. 6  
b) Explain Proportional and GM counters. Specify the differences of these counters. 14
4. Explain the following:  
a) Biosensor 4  
b) pH meter 6  
c) X-ray Absorption Meter 10
5. a) Explain scintillator and its types. 6  
b) With neat diagrams, explain Time-of-Flight and Quadrupole mass spectrometers. 14
6. a) Define Chromatography. Specify its classification. 4  
b) Explain IR gas analyzer. 6  
c) Name an analytic instrument used in hospitals to find potassium and sodium concentrations in the blood plasma. With a neat diagram, explain its working 10

.....