Reg. No.													

04 JAN

Question Paper Code	11549

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

Fifth Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

20EIPC501 - ANALYTICAL INSTRUMENTATION

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	State beer-Lambert law.	2,K1,CO1
2.	List the different types of spectrophotometers.	2,K1,CO1
3.	Define Chromatography.	2,K1,CO2
4.	List the various components used in HPLC.	2,K1,CO2
5.	Discuss the advantages of Thermal Conductivity analyzer.	2,K2,CO3
6.	Mention the applications of thermal conductivity gas analyzer.	2,K2,CO3
7.	Define pH.	2,K1,CO4
8.	Differentiate between glass electrode and reference electrode.	2,K2,CO4
9.	State the basic principle of NMR.	2,K2,CO5
10.	Mention the advantages of Mass Spectrometry.	2,K2,CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain the various types of sources and detectors used for UV-Visible Spectrophotometers.	13, K2,CO1
		OR	
	b)	Explain the working principle of FTIR Spectrometer with neat diagram.	13, K2,CO1
12.	a)	Draw the schematic diagram of a gas chromatography& explain the components in detail.	13, K2,CO2
		OR	
	b)	Draw & explain the instrumentation of High Pressure Liquid Chromatography in detail.	13, K2,CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

13. a) Explain in detail the working principle of O_2 Analyzer based on magnetic susceptibility. *13, K2,CO3*

OR

b) Elucidate the working principle of hot wire Thermal Conductivity Analyzer. *13, K2,CO3*

14. a) List the types of electrodes used for pH measurement and explain the principle of pH measurement. *13, K2,CO4*

OR

b) Explain the silica analyzer and sodium analyzer in detail. *13, K2,CO4*

15. a) Explain the working principle of a pulsed Fourier Transform NMR spectrometer with neat diagram *13, K2,CO5*

OR

b) With neat Sketch explain the instrumentation setup of continuous wave NMR Spectrometer and its function. *13, K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) (i) Explain the constructional detail and working of glass electrode. *8,K2,CO4*

(ii) Explain about the working principle of quadrupole mass analyzers *7,K2,CO5*

OR

b) (i) Explain the principle of conductivity measurement in detail. *8,K2,CO4*

(ii) Explain about the working principle of time of flight mass analyzers. *7,K2,CO5*