U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

August 2024 Supplementary Examinations

Programme: B.E. **Semester: IV**
Branch: Chemical Engineering **Duration: 3 hrs.**
Course Code: 19CH4DCANI **Max Marks: 100**
Course: Analytical Instruments

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1	a)	Classify the instrumental methods of analysis.		**04**
	b)	Discuss the determinate and indeterminate errors in detail.		**08**
	c)	Explain in detail about the application of instrumental analytical techniques used for elemental analysis.		**08**

UNIT - II

2	a)	State and deduce Beer Lamberts Law. Explain the deviations of this law.		**10**
	b)	Discuss the potassium bromide pellet technique for IR spectroscopy in detail and list its advantages as well as disadvantages.		**10**

OR

3	a)	What do you understand by monochromators? With help of a neat diagram explain the prism monochromator in a IR spectrophotometer		**06**
	b)	Explain the working principle of UV visible spectroscopy with a neat diagram.		**08**
	c)	Explain briefly the stretching and bending vibrations.		**06**

UNIT - III

4	a)	Discuss the principle of thermogravimeteric analyzer (TGA) and list its applications and material used for various temperature ranges.		**08**
	b)	Classify various crucibles used for themogravimetric analyzer and draw their sketches.		**06**
	c)	With a neat sketch discuss the working of a bomb calorimeter.		**06**

UNIT - IV

5	a)	Explain the principle of Thermal Conductivity Detector (TCD) in Gas chromatography. List the advantages and disadvantage of TCD.	**10**
	b)	Enumerate the characteristics of a general stationary phase used in gas chromatography.	**10**

OR

6	a)	Explain the principle of gas chromatography with a neat sketch showing all the components.	**10**
	b)	Explain the principle of Electron Capture Detector (ECD) in Gas chromatography.	**10**

UNIT - V

7	a)	Explain the principle of High-Performance Liquid Chromatography (HPLC) with a neat sketch showing all its components.	**12**
	b)	Discuss any three column packings available on a rigid solid structure used in HPCL.	**08**

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