

Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

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Fourth Semester B.E. Degree Examination
Subject Title: Instrumental Analysis (18CH46)

TIME: 03 Hours

Max. Marks: 100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module -1			*Bloom's Taxonomy Level	Mark s
Q.01	a	Define chromatography. Explain the classification of chromatographic techniques based on separation mechanism.	L1	08
	b	Discuss the following terms used in chromatography i) Stationary phase ii) Mobile phase iii) Chromatogram	L2	04
	c	Define the following terms i) Retention factor ii) Column efficiency	L1	08
OR				
Q.02	a	Explain principle, procedure and applications of paper chromatography	L1	08
	b	Discuss principle, techniques of Gel chromatography	L2	04
	c	Discuss counter current extraction	L2	
Module-2				
Q. 03	a	Discuss principle, instrumentation and procedure of gas chromatography	L2	08
	b	Explain the principle, instrumentation involved in High performance thin layer chromatography	L1	08
	c	Discuss applications of gas chromatography	L2	04
OR				
Q.04	a	Explain the principle, instrumentation involved in High performance thin layer chromatography	L1	08
	b	Explain any two detectors in gas chromatography	L1	08
	c	Discuss applications of high performance liquid chromatography	L2	04
Module-3				
Q. 05	a	Explain electromagnetic spectrum. Define the following terms i) Wavelength ii) Frequency and iii) Wave number	L1	08
	b	State Beer's law and Lambert's law. Discuss deviations of Beer's law.	L1	08
	c	Discuss chromophore with example	L2	04
OR				
Q. 06	a	Explain the modes of vibrations in CO ₂ and SO ₂ molecule	L1	08
	b	Write a note on electromagnetic spectrum		08
	c	Discuss applications of UV-Visible spectroscopy	L2	04
Module-4				
Q. 07	a	Explain the construction and instrumentation technique of mass	L1	08

		spectrometry.		
	b	Discuss the process of Electron impact ionization, chemical ionization method in mass spectrometry	L2	08
	c	Discuss the applications of mass spectrometer	L2	04
OR				
Q. 08	a	Explain on isotope abundance measurements and its application by mass spectra.	L1	08
	b	Write a note on fragmentation of i) Types of fission ii) Resolution	L3	06
	c	Explain GC/MS, with all terms		06
Module-5				
Q. 09	a	Explain the instrumentation of NMR spectroscopy, with theory	L1	08
	b	Discuss on i) Chemical shift ii) Spin –spin coupling iii) Shielding and De-shielding iv) Splitting of signals	L2	08
	c	Discuss application of NMR spectroscopy	L2	04
OR				
Q. 10	a	Write a note on i) Hauser effect (NOE) ii) Coupling constant		08
	b	Explain ¹³ CNMR spectra and its applications	L1	06
	c	Explain COSY spectra and its applications	L1	06

*Bloom's Taxonomy Level: Indicate as L1, L2, L3, L4, etc. It is also desirable to indicate the COs and POs to be attained by every bit of questions.