JHARKHAND Rai University
RANCHI

End Semester/Reappear (Semester VII) Examination Dec 2024

Programme: B. Pharm
Course: Instrumental Methods of Analysis **Full Marks: 75**
Course Code: BP701T **Time: 3 Hrs.**
Enrolment no. _____

Q.No.	Questions	CO	Bloom Taxonomy Category	Marks
	Section I			
1	**Objective Type Questions**			
	i. The possible transitions for water molecule in UV-visible region are? (a) σ →σ *(b) n→π *, π→π *(c) σ→σ *, n→π *(d) n → σ* ii. Saturated aldehydes are shown in the range of?(a) σ →σ *(b) π→π *(c) n→π *(d) n → σ* iii. The absorbtion range of π→π *transition is ?(a)100-155 nm (b)170-190 nm (c)170-175nm (d) 200-210nm iv. The bond order of O22+ is ? (a)2 (b)2.5 (c) 3 (d) 3.5 v. The Lamda max value of 2-4 Hexadiene is? (a) 215 nm (b)225nm (c) 27nm (d) 237nm vi. The cycloalkanes, the frequency of absorption for carbonyl group increases with a) Increase in size of the ring b)Decrease in ring size c)decrease in bond angle d)none of these vii. Vibrational transition exists in - a) Infra-red b)microwave c)radio wave region of spectrum viii. The total number of normal modes of vibrational of a linear molecule consisting of N atoms is given by- a) (3N-6) b) (3N-5) c) (3N-7) d) (3N-8) ix. For a linear molecule such as HCl ,the number of modes of vibration are- a)0 b)1 c)2 d)3 x. The factor on which the wave number of absorption depends in infra-red spectroscopy are- a)inductive effect b)Field effect c)Hydrogen bonding d)all of these. xi. The type of hydrogen bonding in organic compounds can be distinguised by taking the spectra after dilution with- a)Water b)methyl alcohol c)CCl4 d)acetone xii. In infra red spectroscopy, the pair of isomers which can not be distinguised is- a)Cis-Trans isomers b)functional isomers c)enantiomers d)posotion isomers xiii. The substance used as an adsorbent in the column chromatography is_____ a) Na^2O b) Na^2SO^4 c) Al^2O^3 d) alum xiv. In gel chromatography the value of Kd if solute is large in size- a)1 b) 2 c)0 d)3 xv. Two compounds I and II eluted by column chromatography (adsorption of I> II). Which one of the following is a correct statement? a) II moves slower and has higher Rf value than I .b) II moves faster and has higher Rf value than I. c) I move faster and have a higher Rf value than II. d) I moves slower and has a higher Rf value than II. xvi. Which of the following cannot be used as adsorbent in Column adsorption chromatography? a) Magnesium oxide b) Silica gel c) Activated alumina d) Potassium permanganate xvii. Ion exchange capacity of a resin is dependent on a) the total molecular weight of the resin b) length of the ion exchange resin c) the total number of ion active groups d) solubility of the ion exchange resins xviii. A sample exhibited has an absorbance 1.0 in UV-Visble spectroscopy. the percentage transmittance will be (a) 1% (b) 0.1% (c) 10% (d) 0.01% xix. What is the radiation range of hydrogen discharge lamb? (a)100-200 nm (b)120-350 nm (c)200-300nm (d)400-500nm xx. How much increment in value of the Lamda(max) for -OCOCH3 group? (a)5 (b)6 (c) 30 (d) 0	CO1	Remember	**1 x 20 = 20**
	Section II			
2. Short Answer type questions.				
a	**0.01 M** Solution of a compound transmits **20%** of the radiation in a container with path length to 1.5 cm. Calculate the molar Extinction Co-efficient of the compound?	CO1	Understand	**7 x 5 = 35**
b	Write about the number of fundamental vibrations and calculate the vibrational degrees of freedom of C_6H_6, H_2S and C_2H_2.	CO2	Remember	
c	What is the principle of adsorption and partition chromatography? What are the factors affecting adsorption column chromatography?	CO3	Understand	
d	List and describe the main components of an HPLC system.	CO4	Understand	
e	Write about the theory of separation of gel-chromatography with equation?	CO5	Understand	
f	Write about the classification of Resins?	CO5	Understand	

	or			
	Write the principle of Ion-exchange chromatography?	CO5	Remember	
g	How does TLC work? What are some applications of **TLC**?	CO3	Remember	
	or			
	What is the major difference between thin layer chromatography and paper chromatography? What are some common methods to visualize spots on a TLC plate?	CO3	Remember	
Section III				
Long Answer Type questions				
3	Draw the Characteristic absorptions range of finger-print region? The (C-H) Stretching vibrations in Chloroform occurs at 3000cm- 1.Calculate the (C-D) stretching frequency in Deutero-Chloroform.	CO2	Create	
	or			
	Briefly explain about the principle and instrumentation of Nepheloturbidometry.	CO2	Analyze	**2 x 10 = 20**
4	Explain the theory, instrumentation, advantages and applications of High performance liquid chromatography (HPLC).	CO4	Create	
	or			
	Elaborate the theory, instrumentation, advantages and applications of gas chromatography.	CO4	Analyze	

Course Outcomes (CO):

CO1: Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
CO2: Understand the chromatographic separation and analysis of drugs
CO3: Perform quantitative & qualitative analysis of drugs using various analytical instruments
CO4: Gas chromatography & High performance liquid chromatography
CO5: ion exchange chromatography & Gel chromatography