Name:

Enrolment No:

UPES

End Semester Examination, December 2023

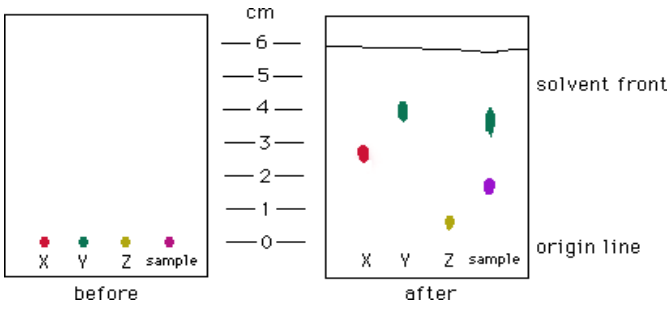
Course: Pharmaceutical Analysis **Semester : 5th**

Program: Integrated BSc. -MSc. Clinical Research **Duration : 3 Hours**

Course Code: HSPC 30010 **Max. Marks: 100**

Instructions: Give answer to all following questions

S. No.	Section A Short answer questions (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	What is the role of Rf value in chromatography?	1.5	CO2
Q 2	Why solvent degasser is used in HPLC?	1.5	CO3
Q 3	Which physical property is used in column chromatography?	1.5	CO3
Q 4	How Dragendorff reagent can be prepared?	1.5	CO1
Q 5	What is UV and Visible range for spectroscopical analysis?	1.5	CO4
Q 6	Write down the disadvantages of paper chromatography.	1.5	CO1
Q 7	Why inert gas is used as mobile phase for gas chromatography?	1.5	CO2
Q 8	Give one example of universal detector for HPLC study. Why is it called “universal”?	1.5	CO3
Q 9	What do you mean by gradient elution technique? What is the use of it?	1.5	CO1
Q 10	Why is quartz cuvette used in UV spectroscopy?	1.5	CO4
Q 11	Why are silica particles used for chromatography study?	1.5	
Q 12	What are silica pore sizes of C4 and C8 columns?	1.5	CO5
Q 13	What is the difference between packed column and capillary column for GC?	1.5	CO1
Q 14	In reverse phase chromatography, what are the columns used for basic substances?	1.5	CO1
Q 15	Which buffer is used for anion exchange chromatography and why?	1.5	CO5
Q 16	Give two examples of polar as well as non-polar solvents which are used to make mobile phases.	1.5	CO1
Q 17	What agarose concentration should be used in the preparation of a gel?	1.5	CO1
Q 18	What do you mean by C18 column?	1.5	CO1
Q 19	What is the use of ethidium bromide in gel electrophoresis?	1.5	CO2
Q 20	Which principle is best for paper chromatography and why?	1.5	CO1

Section B **(4Qx5M=20 Marks)**			
Q 1	What is the basic principle of UV-Vis spectroscopy? Write down the use of UV-Vis spectroscopy.	**(3+2)**	**CO4**
Q 2	What are the different methods used for paper chromatography? Explain it.	**5**	**CO2**
Q 3	Discuss the different types and use of gel electrophoresis.	**5**	**CO3**
Q 4	What is the principle and use of affinity chromatography?	**(2.5+2.5)**	**CO1**
Section C **(2Qx15M=30 Marks)**			
Q 1	(A) It was suspected that a particular mixture contained three components: X, Y and Z. To check this, the mixture was analyzed by thin layer chromatography. In this experiment a nonpolar solvent was used with a polar stationary phase. The following results were obtained:  Answer the following questions. (i). Which suspected components (X, Y or Z) are present in the sample? Is it polar or non-polar? (ii). What color identification test can be performed if the unidentified compound is alkaloid? (iii). What are the Rf values of all these components? (iv). Which of the suspected components is the most polar and least polar? Justify it. **(B)** Write a short note on ninhydrin agent and 2,4-DNP which are used as spraying agents during TLC study. **(C)** Explain all different factors which can affect the TLC chromatography study.	**(5+5+5)**	**CO4**
Q2	**(A)** What is the role of a detector in HPLC study? Explain the functions of three different detectors for HPLC analysis. **(B)** What to do when back pressure increases? What is the cause of baseline drift or noise?	**8+(2+2) +3**	**CO3**

	(**C**) What do you understand by theoretical plate concept and how theoretical plate affects the separation of HPLC Column?		
Section D **(2Qx10M=20 Marks)**			
Q 1	**(A)** What is the principle of gas chromatography? **(B)** Briefly discuss the working procedure of gas chromatography through diagram. **(C)** Write a short note in Flame Ionization Detector (FID)	**2+5+3**	**CO5**
Q 2	**(A)** Define Ion-exchange chromatography. **(B)** What chemicals are used in ion exchange chromatography? **(C)** Explain the cause and remedies of following situations for ion exchange chromatography: (i) Proteins do not bind or elute as expected. (ii) Air bubbles in the bed. Cracks in the bed.	**2+2 +(3+3)**	**CO2**

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