DEPARTMENT OF PHARMACEUTICAL SCIENCES & TECHNOLOGY BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI (Internal Assessment I)			
CLASS: BPHARM		**SEMESTER:**	**III**
BRANCH: PHARMACY		**SESSION:**	**MO/2025**
SUBJECT: BP302T PHYSICAL PHARMACEUTICS-I			
TIME: 2.00 Hours		**FULL MARK:**	**30**

PART I

A.	Objective-type questions (Answer all questions)	(5 x 02 = 10 marks)
1.	Define (a) hydrogen bonds and (b) covalent bonds, with suitable examples.	
2.	Why do alkanes with an even number of carbon atoms have a higher melting point than alkanes with an odd number of carbon atoms?	
3.	Define vapour pressure.	
4.	What is the critical solution temperature and how does it affect the miscibility of partially miscible liquid pairs like phenol and water?	
5.	Why does the solubility of gases decrease with an increase in temperature? Explain.	

PART II

B.	Long Answers (Answer any one out of two)	(01x10=10 marks)
1.	(a) Explain the phase diagram of water with a suitable diagram. (5 marks) (b) Explain the solubility behaviour of phenol in water with reference to partial miscibility. Discuss the effect of temperature and the concept of critical solution temperature. (5 Marks)	
2.	(a) The vapour pressure of ethyl alcohol is 23.6 mm at 10 ℃. The average heat of vaporization between 10 ℃ and 40 ℃ is 10,250 cal/mole. Using the Clausius-Clapeyron equation, calculate the vapour pressure at 40 ℃. (5 marks) (b) With the help of a suitable diagram, explain the mechanism of solute–solvent interactions in relation to drug solubility. (5 marks)	

PART III

C.	Short Answers (Answer any two out of three)	(02x05=10 marks)
1.	(a) Explain the process of liquefaction of gas. (b) Enlist and explain various factors that affect the solubility of gases in liquids.	
2.	(a) What are liquid crystals? (b) Distinguish between smectic and nematic liquid crystal.	
3.	Enumerate and explain the various factors affecting the solubility of drugs with suitable examples.	

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