PRN:		Course Code:	USS302

Second Year **B. Sc.** Semester End Examination Summer 2024 (Backlog)

Chemistry-III 000626

Day and Date: Mon 2 DEC 2024 Max Marks: **100**

Time: 10:30AM To 01.30PM Duration: **03** hrs

Instructions: All questions are compulsory.
Use of scientific calculator is allowed.

		Marks	Bloom's Level	CLO
Q.1	**Attempt the following.**			
a)	Define the Gibb's phase rule. Discuss the terms involved in Gibb's Phase rule.	08	L2	CLO1
b)	Draw a neat labeled phase diagram of water system. Discuss the importance of various curve, lines and area at equilibrium	08	L2	CLO1
c)	Draw a neat labelled phase diagram of lead-silver system. Discuss the significance of it in de-silverization of lead.	09	L3	CLO1
	Or			
c)	Calculate the number of phases, component and degree of freedom in the following system 1) Solid carbon in equilibrium with CO, CO_2 and O_2. 2) A gas is in equilibrium with its solution in a liquid. 3) A mixture of nitrogen and oxygen gases in a vessel	09	L3	CLO1
Q.2	**Attempt the following.**			
a)	Write the postulates of kinetic theory of gases.	08	L2	CLO2
b)	Explain the root mean square velocity of a gas. Derive mathematical relation between average velocity and root mean square velocity.	08	L2	CLO2
c)	State and explain Boyle temperature of a gas using P-V isotherms at different temperatures.	09	L2	CLO2
	Or			
c)	Explain average velocity. Calculate average velocity of H_2 at 373 K.	09	L2	CLO2
Q.3	**Attempt the following.**			
a)	Discuss one dimensional and two dimensional pacing of particles in crystals.	08	L2	CLO3
b)	What is the Bravais lattice? Discuss the classification of Bravais lattice systems.	08	L2	CLO3

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	c) Explain the difference between crystalline and amorphous solids.	09	L3	CLO3
	Or			
	c) Explain the structure of KCl on the basis of X-ray diffraction studies.	09	L3	CLO3
Q.4	**Attempt the following.**			
	a) What is reduced phase rule? Describe phase diagram of the two component system involving eutectic point.	08	L2	CLO1
	b) What is most probable velocity? Derive an equation for the most probable velocity of a gas.	08	L3	CLO2
	c) Discuss law of rational indices. Calculate the miller indices of the plane having intercepts on crystallographic axis (2a, b, ∞c).	09	L2	CLO3
	Or			
	c) Using equation of kinetic theory show that, PV= constant and V/T = constant for Boyles law and Charles law respectively.	09	L3	CLO2

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