

Reg. No.:



Name:

University of Kerala

W6652

Third Semester FYUGP Degree Examination, November 2025

Discipline Specific Core Course

CHEMISTRY

UK3DSCCHE200 - PHYSICAL CHEMISTRY - I

Academic Level: 200-299

2024 Admission

Time: 1 Hour 30 Minutes(90 Mins.)

Max. Marks: 42

Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark
Each.Answer all questions

Qn No.	Question	CL	CO
1	Give the equation for average velocity.	RE	3
2	State Hardy–Schulze law	RE	4
3	How does the addition of NaCl affect the vapor pressure of water?	UN	2
4	Give one example of a gas that shows positive deviation from ideal behaviour.	UN	3
5	Explain the difference between molarity and molality	UN	4
6	Sketch the (110) plane of a cubic crystal.	UN	1

Part B.8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Explain reverse osmosis	UN	4
8	Differentiate between smectic and nematic liquid crystals-	UN	2
9	Calculate the miller indices of a plane cutting the axes at 2a,4b and c.	AP	1
10	Calculate the root mean square velocity of O ₂ at 300 K	AP	3

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO
11	A) Compare the advantages and limitations of the rotating crystal method and powder method in crystal structure determination. OR B) Apply band theory to explain why semiconductors are preferred over metals in making electronic devices like transistors.	AP	1, 1
12	A)	AN	2, 2

Qn No.	Question	CL	CO
	You are asked to determine the surface tension of an unknown liquid in the laboratory. A reference liquid of known surface tension is provided. Analyse how you would plan and carry out the experiment OR B) (a) Compare the flow behavior of water, cooking oil, and honey at room temperature. Relate the differences to molecular interactions and viscosity (b) Explain how increasing temperature affects the viscosity of these liquids (c) Discuss any two applications of viscosity in every day life.		
13	A) Evaluate the assumptions made in the kinetic theory of gases. Which of the assumptions fail for real gases at high pressure and low temperature? OR B) Critically evaluate the significance of Maxwell distribution curve in explaining the speed of molecular velocities of gases. Assess how Maxwell distribution of molecular velocities changes with increasing temperature.	EV	3, 3
14	A) Describe the applications of colloids in industry and environment, including Cottrell precipitator, water purification and delta formation. OR B) Design an experiment using the cooling curve method to determine the molecular mass of a non-volatile solute in water. Include details of apparatus, measurements, and calculations	CR	4, 4