

Reg. No.:



Name:

Y8591

University of Kerala

Second Semester FYUGP Degree Examination, June 2026

Discipline Specific Core Course

CHEMISTRY**UK2DSCCHE101 - FUNDAMENTALS OF CHEMISTRY II**

Academic Level: 100-199

2024 Admission onwards

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	Which is the main constituent of natural gas.	RE	2
2	What is the difference between a crystal and amorphous solid?	RE	3
3	Which crystal system is defined by having all three axes of equal length and all angles equal to 90 degrees?	UN	3
4	Why is the RMS velocity always higher than the average velocity in a gas?	UN	1
5	Explain why zone refining is used for semiconductor purification.	UN	4
6	LPG is considered as an efficient domestic fuel. Defend the statement.	UN	2

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	Describe the significance of the octane number in determining fuel quality.	UN	2
8	Explain the terms in the van der Waal's equation of state for n moles of a real gas.	UN	1
9	Explain the applications of nano materials in medical field.	AP	4
10	Calculate the RMS velocity of O ₂ molecule at 25 °C.	AP	1

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) Explain Bragg's equation and discuss how you would apply it to determine unknown crystal structures. OR B) a) Find Miller indices of plane whose intercepts are a,3b, c. (b) Silver crystallises in FCC lattice with edge length of 4.08×10^{-10} m. If density of silver is $10.53 \times 10^3 \text{ kgm}^{-3}$ Calculate Avogadro number. Atomic weight of silver is 107.9 amu.	AP	3, 3
12	A) Compare Linde's and Claude's processes for liquefaction of gases. OR B) Correlate the concept of mean free path with collision frequency and molecular velocities in gases.	AN	1, 1
13	A) Compare the mechanical, optical, and magnetic properties of nanomaterials, and evaluate their medical applications. OR B) Compare the electrometallurgical processes used for the extraction of sodium and aluminium.	EV	4, 4

Qn No.	Question	CL	CO
14	A) Compare and analyze the use of petroleum products and renewable energy in terms of environmental Impact, economic feasibility, and long-term sustainability. OR B) Compare and contrast the operational principles, advantages, and limitations of conventional solar cells with nanostructured solar cells.	CR	2, 2