G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2024.
(For those admitted in June 2021 and later)

PROGRAMME AND BRANCH: B.Sc., CHEMISTRY

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
I	PART - III	CORE	U21CH102	PHYSICAL CHEMISTRY I

Date & Session: 16.11.2024 / AN **Time : 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	SECTION – A (10 X 1 = 10 Marks) Answer ALL Questions.
CO1	K1	1.	Ideal gases obey all gas laws at _____. a) low temperature and high pressure b) low temperature and low pressure c) high temperature and low pressure d) all temperature and pressure
CO1	K2	2.	How many degrees of freedom has present in monoatomic gases? a) 3 b) 5 c) 6 d) 7
CO2	K1	3.	Which of the following are the principle laws of photochemistry? a) Raoult's and Dalton's law b) Raoult's and Henry's law c) Grothus-Draper and Stark-Einstein laws d) Lambert's and Beer's law
CO2	K2	4.	Which of the following is an example of photochemical reaction? a) Decomposition of ammonia b) Decomposition of HCl c) Photosynthesis d) Formation of HI
CO3	K1	5.	A half-life is _____. a) constantly changing b) half of the life time of unstable nucleus c) the time for one-half of an unstable nuclei to decay d) independent of the rate for decay
CO3	K2	6.	The purpose of control rods in a fission reactor is to _____. a) cool down the nuclear fuel b) prevent oxygen from reaching the fuel c) control the rate of nuclear fission d) increase the power generation
CO4	K1	7.	How many times is the number of octahedral voids as compared to tetrahedral voids. a) 0.5 b) 2 c) 4 d) 8
CO4	K2	8.	Frenkel defect is not shown in _____. a) ZnS b) AgCl c) AgI d) NaCl
CO5	K1	9.	Predict, Which of the following is not a colligative property? a) vapour pressure b) Depression of freezing point c) elevation in boiling point d) osmotic pressure
CO5	K2	10.	Camphor is often used in molecular mass determination because, it is a) readily available b) volatile c) solvent for organic substances d) has very high cryoscopic constant

Course Outcome	Bloom's K-level	Q. No.	SECTION – B (5 X 5 = 25 Marks) Answer ALL Questions choosing either (a) or (b)
CO1	K3	11a.	Apply the postulates of kinetic theory of gases for ideal gas.
			(OR)
CO1	K3	11b.	What are Collision diameter and Collision number?
CO2	K3	12a.	Write any two laws of photochemistry.
			(OR)
CO2	K3	12b.	Write the differences between thermal and photochemical reactions.
CO3	K4	13a.	Illustrate half-life period and average life period.
			(OR)
CO3	K4	13b.	Examine the working of nuclear reactors.
CO4	K4	14a.	Derive Bragg's equation.
			(OR)
CO4	K4	14b.	Analyse the structure of KCl.
CO5	K5	15a.	Predict the laws of osmosis.
			(OR)
CO5	K5	15b.	Deduce Van't Hoff factor.

Course Outcome	Bloom's K-level	Q. No.	SECTION – C (5 X 8 = 40 Marks) Answer ALL Questions choosing either (a) or (b)
CO1	K3	16a.	How we can Calculate Most Probable Velocity, Average Velocity and Root Mean Square velocity?
CO1	K3	16b.	**(OR)** Compute the effect of temperature and pressure on the coefficient of viscosity.
CO2	K4	17a.	Using Jablonski diagram, analyse and explain different energy transfers in photochemical reactions.
			(OR)
CO2	K4	17b.	Infer the kinetics of photochemical combination of hydrogen and chlorine.
CO3	K4	18a.	Comment on different models of nuclear shell structure.
			(OR)
CO3	K4	18b.	Illustrate the applications of the radioisotopes in the study of reaction mechanisms.
CO4	K5	19a.	Examine the determination of structure of crystals by X- ray diffraction methods.
			(OR)
CO4	K5	19b.	Compare stoichiometric and non-stoichiometric crystal defects.
CO5	K5	20a.	Evaluate the relationship between relative lowering of vapour pressure and molecular mass.
CO5	K5	20b.	**(OR)** Justify, How the Rast method is used to identify the molecular mass of an unknown solute.