

Enrollment No: _____

Exam Seat No: _____

C. U. SHAH UNIVERSITY

Winter Examination-2022

Subject Name: Physical Chemistry-IV

Subject Code: 4SC06PCH1

Branch: B.Sc. (Chemistry)

Semester: 6

Date: 22/09/2022

Time: 11:00 To 02:00

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1	Attempt the following questions:	(14)
a)	What is isotonic solution?	01
b)	What are the colligative properties?	01
c)	Define nuclear chain reaction	01
d)	What is reaction rate?	01
e)	Write the Nernst's statement for Third Law of Thermodynamics.	01
f)	Explain the term nuclear reactions.	01
g)	What is ideal solution?	01
h)	Define mass defect	01
i)	Which type of water is more efficient as a coolant in nuclear reactor.	01
j)	Define: Reversible reaction	01
k)	Give the unit of zero order reaction.	01
l)	Define chemical kinetics	01
m)	Define: Radioactivity	01
n)	A reactant whose concentration does not affect the reaction rate follows which order of reaction?	01

Attempt any four questions from Q-2 to Q-8

Q-2	Attempt all questions	(14)
a)	Write a note on boiling point elevation.	07
b)	Derive the rate constant equation for first order reaction.	07
Q-3	Attempt all questions	(14)
a)	What is transition state theory? Explain with diagrams.	07
b)	The value of K_p at 20°C for the reaction is $1.9 \times 10^3 \text{ atm}^{-1}$. Calculate the value of K_c at the same temperature.	03
c)	Discuss the reverse osmosis.	04



Q-4	Attempt all questions	(14)
	a) Explain the Law of Mass Action.	07
	b) How to determine the osmotic pressure? Write any two methods.	07
Q-5	Attempt all questions	(14)
	a) Write the differences between order of reaction and molecularity.	04
	b) Discuss Le Chateliers Principle in detail	10
Q-6	Attempt all questions	(14)
	a) Calculate the half-life of radium-226 if 1 g of it emits 3.7×10^{10} alpha particles per second.	03
	b) Derive Boltzman's entropy equation.	04
	c) Write a note on Nuclear Fission Reactions with all the examples.	07
Q-7	Attempt all questions	(14)
	a) Explain the properties of Alpha and Beta rays.	07
	b) Discuss the collision theory of reaction rate.	07
Q-8	Attempt all questions	(14)
	a) Explain the Nernst Heat theorem in detail.	07
	b) Derive the Raoult's law with figure.	07

