Enrollment No: _____ Exam Seat No: _____

C. U. SHAH UNIVERSITY

Winter Examination-2022

Subject Name: Physics - I

Subject Code: 4SC01PHY1 **Branch: B.Sc. (All)**

Semester: 1 **Date: 05/01/2023** **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 do you mean by Scalar quantity?	01
b)	Classify the scalar and vector quantity: Force, Displacement, Speed, Time.	01
c)	Define Gradient.	01
d)	Define homogeneous function.	01
e)	State Newton's Law of Gravitation.	01
f)	List the fundamental forces of nature.	01
g)	What is the full form of GPS?	01
h)	What is inertial frame of reference?	01
i)	State the Newton's Third Law of Motion.	01
j)	How a collision can be called an inelastic collision?	01
k)	Define electromagnetic induction.	01
l)	Name the types of voltage sources.	01
m)	What do you mean by periodic time?	01
n)	Define periodic motion.	01

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

Q-2 **Attempt all questions** **(14)**

a)	Write a detailed note on vector integration.	**06**
b)	Define Vector quantities and explain Gradient, Divergence and Curl in brief.	**08**

Q-3 **Attempt all questions** **(14)**

a)	State the Kepler's laws.	**03**
b)	Derive an expression for the escape velocity and explain it.	**06**
c)	Write a note on GPS.	**05**

Q-4 **Attempt all questions** **(14)**

a)	Distinguish between conservative force and non-conservative force and give examples of it and prove that the work done by the conservative force along a closed path is always zero.	**07**

	b)	Define and derive an expression for the elastic collision in one dimension.	**07**
Q-5		**Attempt all questions**	**(14)**
	a)	Write a detailed note on mutual inductance with necessary diagrams.	**07**
	b)	Explain the Faraday's Law of electromagnetic induction.	**06**
	c)	Define Lenz law.	**01**
Q-6		**Attempt all questions**	**(14)**
	a)	State and derive equation for the maximum power transform theorem.	**07**
	b)	Write a note on Thevenin's theorem with necessary diagram.	**07**
Q-7		**Attempt all questions**	**(14)**
	a)	Draw and explain an equivalent circuit using Norton's Theorem.	**08**
	b)	Derive an equation for an angular momentum of a particle and explain its physical significance.	**06**
Q-8		**Attempt all questions**	**(14)**
	a)	Briefly discuss the angular SHM and derive the formula for the total energy.	**08**
	b)	Define;	**06**
		1. SHM	**2**
		2. Frequency	**2**
		3. Phase and phase constant	**2**