Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name:Physics-1

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

Semester: 1 **Date:28/03/2017** **Time: 10:30 To 1:30** **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) Define vectors.
b) Vectors obey _____ law of addition.
c) Define unit vector.
d) Name the two types of vector products.
e) State Newton's laws of motion.
f) Define the state of weightlessness.
g) What do you mean by frame of reference?
h) Define Work and give its formula.
i) How is angular momentum (L) related to the moment of inertia (I) of a rigid body?
j) Define Plasticity.
k) State Hooke's law.
l) What is Poisson's ratio?
m) State Faraday's law of induction.
n) According to the theory of relativity; the speed of light _____.
(a) Increases (b) Decreases (c) Remains constant

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

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

a) Derive the expression for the cross product of two vectors A and B. **(05)**

b) State Newton's law of gravitation and give its formula. **(03)**

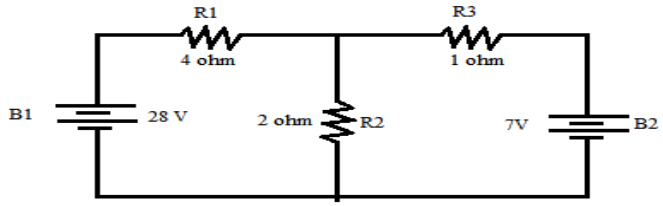
c) Define the Gravitational Potential Energy. **(06)**
Derive the expression for the gravitational potential for a point outside the sphere

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

a) State Kepler's laws. **(06)**
Give the principle behind the motion of satellites.

b) Define Escape velocity and derive its formula. **(05)**

	c)	Explain the basic idea behind the global positioning system.	**(03)**
Q-4		**Attempt all questions**	**(14)**
	a)	State Newton's laws of motion. Explain conservative and non conservative forces with the help of examples.	**(06)**
	b)	State the work energy theorem and give its proof.	**(03)**
	c)	Explain the concept of conservation of linear momentum.	**(05)**
Q-5		**Attempt all questions**	**(14)**
	a)	Explain the concept of rocket propulsion based on the system of variable masses and hence determine the final velocity of a rocket.	**(08)**
	b)	Explain briefly the angular momentum of a rigid body and hence explain the law of conservation of angular momentum.	**(06)**
Q-6		**Attempt all questions**	**(14)**
	a)	Explain briefly the various modulus of rigidity.	**(07)**
	b)	Explain the Torsional pendulum.	**(07)**
Q-7		**Attempt all questions**	**(14)**
	a)	State the postulates of special theory of relativity.	**(02)**
	b)	Define self and mutual inductance. Derive the relation $M=\sqrt{(L_1L_2)}$	**(05)**
	c)	Explain the concept of length contraction.	**(07)**
Q-8		**Attempt all questions**	**(14)**
	a)	Based on the mesh current method; determine the currents I_1 and I_2 for the circuit given below.	**(04)**



	b)	Explain the working of a transformer and explain its different types.	**(05)**
	C)	Explain the concept of centre of mass and derive its formula for a two body system having equal masses.	**(05)**