Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name: Physics-I

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

Semester: 1 **Date: 27/03/2018** **Time: 02:30 To 05:30** **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) State Hooke's law.
b) Define torque.
c) What do you mean by damped oscillations?
d) Name the two types of vector products.
e) State Newton's law of gravitation.
f) Define Mutual inductance
g) State Norton's theorem
h) State Faraday's law of induction.
i) How is angular momentum (L) related to the moment of inertia (I) of a rigid body?
j) Define Elasticity.
k) Give the difference between vectors and scalars.
l) What is Poisson's ratio?
m) Define the term Work
n) Give two applications of multimeter

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

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

a Explain Gravitational Potential Energy and derive the expression for the gravitational potential for a point outside the sphere **08**

b Derive the expression for the cross product of two vectors A and B. **06**

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

a Explain conservation of momentum and energy **06**

b State Kepler's laws. Write the principle behind the motion of satellites. **08**

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

a State Newton's laws of motion with examples justifying each law **07**

b Explain the concept of rocket propulsion based on the system of variable masses and hence determine the final velocity of a rocket. **07**

Q-5		**Attempt all questions**	**(14)**
	a	Determine modulus of rigidity and moment of inertia by Searle's method.	**07**
	b	Write the differential equation of SHM and find its solutions	**07**
Q-6		**Attempt all questions**	**(14)**
	a	Explain briefly the various modulus of elasticity.	**07**
	b	Explain Torsional pendulum in detail	**07**
Q-7		**Attempt all questions**	**(14)**
	a	Explain the concept of length contraction using suitable example.	**05**
	b	State the postulates of special theory of relativity.	**03**
		Define self and mutual inductance.	**06**
		Derive the relation $M=\sqrt{(L_1L_2}$	
Q-8		**Attempt all questions**	**(14)**
	a	Explain the working of a transformer. Explain its different types.	**07**
	b	Based on Node voltage method; write the equations necessary to determine I_1, I_2 and I_3 for the following circuit.	**07**