

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.
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- 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  $M = \sqrt{L_1 L_2}$
- 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**

