Daffodil International University
Department of Computer Science & Engineering
Faculty of Science & Information Technology
Mid-term Examination, Semester: Summer 2019
Course Code: PHY-113   Course Title: Basic Physics
Course Teacher: ALL

Time: 1 hour 30 minutes   Full Marks: 25

SET-A

Answer any two from the following questions: (4×2)=8

1. What is moment of inertia? Find out the moment of inertia of a thin uniform rod 4
   axis passing through its center.

2. What is trajectory? Show that, the trajectory of the projectile follows 4
   parabolic path.

3. Write down the differential equation of simple harmonic motion. Prove that, 4
   the total energy of a particle executing simple harmonic motion remains
   constant.

SET-B

Answer any four from the following questions: (4×3)=12

1. A minimum force 7N is required to make a body of mass 2kg move on a 3
   horizontal floor. But a force 5N is required to maintain its motion with a
   uniform velocity. Calculate coefficient of static friction and coefficient of
   kinetic friction.

2. The equation of motion of particle executing SHM is $y=20 \sin (wt+\delta)$. Its time 3
   period is 25 seconds and initial displacement is 0.007m Determine its angular
   frequency and initial phase.

3. A wheel of a car weighing 15kg and radius of gyration about an axis is 0.5m. 3
   What is its moment of inertia? What amount of torque will be need to apply
   to produce angular acceleration of 3rad/s in the wheel?

4. A pallet was thrown horizontally from a tower with a velocity 800ft/sec and 3
   it touched the ground after 2s. Find the height of the tower and the distance
   from the bottom of the tower to the point where the pallet touched the
   ground?

5. If an object is hung at one end of a spring, it extends by 30 cm. The object is 3
   stretched a little and released, what is the frequency of oscillation?

Answer all the following multiple choice questions: **(5×1)=5**

1. The projectile motion has no acceleration in the ....direction   1

    (I)   Horizontal   (II) Vertical   (III) Straight line

2. Coefficient of friction (μ) brings the ratio of the two......................   1

    (I)   Mass   (II) Force   (III) Momentum

3. Moment of inertia of an object will be larger if it has the   1

    (I)   Large Force   (II) Large Mass   (III) Large Momentum

4. The velocity of the particle executing simple harmonic motion.............   1

    (I) $V=\omega\sqrt{A^2-X^2}$ (II) $V=\omega\sqrt{A^2-K^2}$ (III) $V=\omega\sqrt{m^2-K^2}$

5. The concept comes from the Newton's first law of motion................   1

    (I)   Inertia   (II) Action force (III) Momentum