

9) Which of the following is **not correct** concerning a conservative force?

- a) Its work depends on the end points of the motion. b) It has a potential energy.
c) Its work doesn't depend on the path followed. d) Its work can't be negative.

10) A particle displaced between two points. If the work done by gravity on a particle is 12 J, the change in its gravitational potential energy is

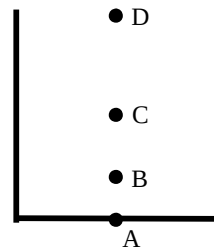
- a) 12 J b) -12 J c) zero d) 6 J

11) A particle is compressed a distance x against a spring of force constant k . The potential energy of the particle is

- a) $-\frac{1}{2}kx^2$ b) $\frac{1}{2}kx^2$ c) $-kx$ d) kx

12) A thick uniform wire is bent into the shape of the letter U as shown. Which point indicates the location of the center of mass of the wire?

- a) A b) B c) C d) D



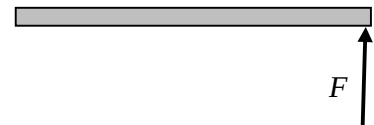
13) The change in momentum of a 2-kg object is + 50 kg.m/s. The impulse on such object is

- a) + 25 N.s b) - 25 N.s c) + 50 N.s d) - 50 N.s

14) A 65-kg person stands on frictionless horizontal surface with a stone of mass 4.5 kg in his hands. He throws the stone forward with a speed of 12 m/s horizontally. The person will move with

- a) 1.2 m/s forward b) 1.2 backward c) 0.8 m/s forward d) 0.8 m/s backward

15) A uniform rod resting on a frictionless horizontal surface is acted by a force at one end as shown. The center of mass of the rod will

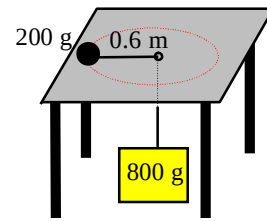


- a) remain at rest. b) move in a circle.
c) move in a straight line. d) move in a parabola

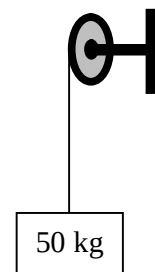
PART II: Solve the following problems

(4×10=40 pts)

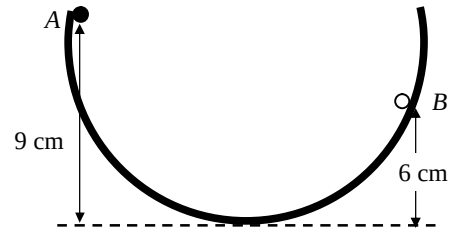
- Q1)** A 200-g mass on a frictionless table is attached to a hanging block of mass 800 g by a cord through a hole in the table as in the figure. The suspended block remains in equilibrium while the mass revolves on the surface of the table in a circle of radius 0.6 m. What is the speed of the mass?



- Q2)** A block of mass 50 kg is attached to a cord that is wrapped around a fixed pulley as shown. The block is lowered at constant acceleration of 2.5 m/s^2 . When the block has fallen a distance 4 m, find the work done by the cord.



- Q3)** A particle of mass 100 g is released from rest at point A along the diameter on the inside of a smooth hemispherical bowl of radius $R=9$ cm, as shown. Calculate its speed at point B.



- Q4)** A block of mass 12 kg sliding on a frictionless surface explodes into two equal pieces. One piece goes east at 6 m/s, and the other piece goes 30° north of east at 8 m/s. What is the original velocity of the block?