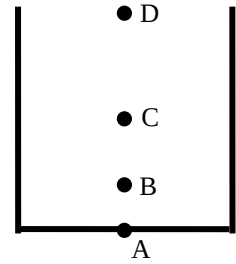


9) Which of the following is **not correct** concerning a conservative force.

- 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 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

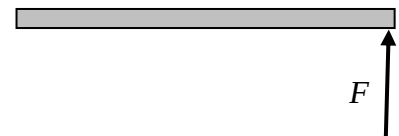
11) The change in momentum of a 2-kg object is + 50 kg.m/s. The impulse on such object is

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

12) 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

13) 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

14) A 1-kg block is traveling east at 8 m/s. It strikes a 3-kg block which is traveling west at 6 m/s. The two blocks stick together. Their common final speed is

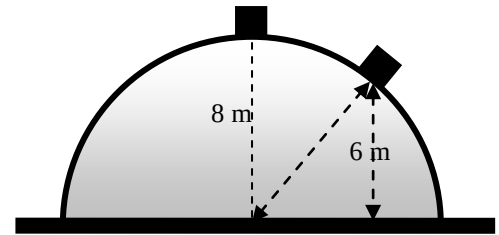
- a) 8 m/s west b) 4 m/s west c) 8 m/s east d) 4 m/s east

15) The collision is elastic if

- a) momentum is conserved but kinetic energy is not. b) both momentum and kinetic energy are conserved.
c) kinetic energy is conserved but momentum is not. d) neither momentum nor kinetic energy is conserved.

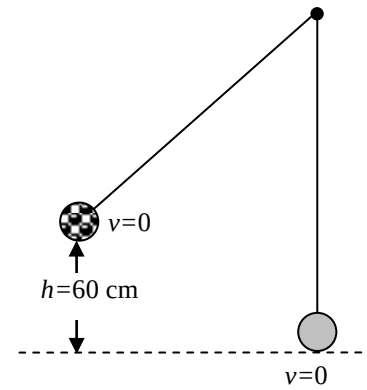
PART II: Solve the following problems**(4×10=40 pts)**

- Q1)** A block of mass 8 kg starts from rest at the top and slides down a hemispherical hill of radius 8 m. Find the speed of the block when it is 6 m high.



- Q2)** Referring to the previous problem, Find the normal force the hill exerts on the block when it is 6 m high.

- Q3)** Two identical pendulums are initially at rest with one is at 60 cm high, as shown in the figure. If they stick together after collision, what is the common speed of the combination?



- Q4)** A ball of mass $m_1 = 8 \text{ kg}$ moving east with a speed of 12 m/s collides with another ball of mass $m_2 = 12 \text{ kg}$ moving north with a speed of 6 m/s, as shown in the figure. After collision the two balls stuck and move together. Find the **velocity** of the system after collision.

