

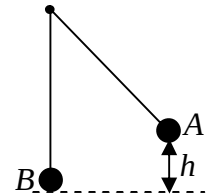
14) A force is conservative if its work

- a) depends on the initial and the final points of the motion.
- b) is zero.
- c) depends on the path followed.
- d) Non of these.

15) The mechanical energy of a system is conservative only when

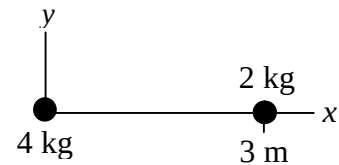
- a) no external force acts on the system
- b) no frictional force acts on the system.
- c) no work done by the nonconservative forces
- d) no nonconservative forces act on the system

16) The ball of the simple pendulum shown is released from rest at point A. Its speed at point B is



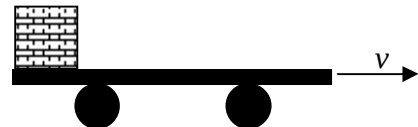
- a) $\frac{1}{2}\sqrt{gh}$
- b) $\sqrt{gh/2}$
- c) $\sqrt{2gh}$
- d) $2\sqrt{gh}$

17) The x -coordinates of the center of mass of the two particles shown is



- a) 1 m
- b) 1.5 m
- c) 3 m
- d) 0.5 m

18) A block rests on a cart that slides along a smooth horizontal surface. If the block falls off the crate with zero speed relative to the cart, the speed of the cart

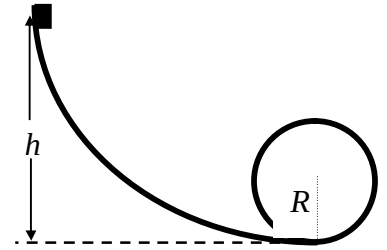


- a) will not be changed.
- b) will increase.
- c) will decrease.
- d) depends on whether the surface of the crate is smooth or rough.

PART II: Solve the following two problems

(2×15=30 pts)

- Q1)** A small block of mass m slides without friction around a loop-to-loop of radius 3 m, as shown in the figure. Find the minimum value of h for the block not to fall at the top of the loop.



- Q2)** A block of mass 10 kg sliding on a frictionless surface explodes into two equal pieces. One piece goes north at 6 m/s, and the other piece goes 30° north of west at 4 m/s. What was the original velocity of the block?