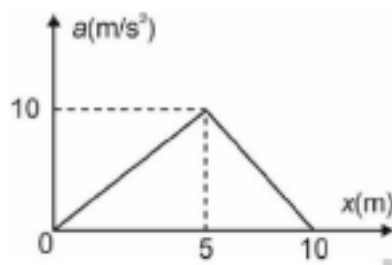




This section contains 20 multiple choice questions. Each question has 4 options (1), (2), (3) and (4) for its answer, out of which **ONLY ONE** option can be correct.

**Marking scheme: +4 for correct answer, 0 if not attempted and -1 in all other cases.**

1. Acceleration (a) vs position (x) graph of a particle moving in straight line is given by graph as shown. if initial velocity is zero then velocity at  $x = 10$  m, is



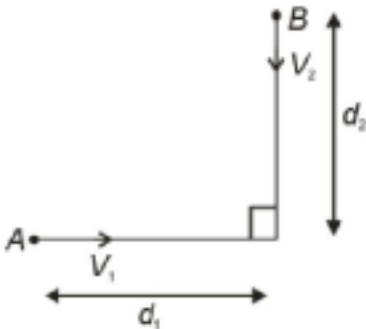
- (1) 12 m/s (2) 10 m/s (3) 8 m/s (4) 5 m/s

2. Position (x) of particle as a function of time (t) is given by  $x = at - bt^2$ . Distance travelled by particle in time  $t = 0$  to  $t = \frac{a}{b}$  is

$$(1) \frac{a^2}{b} (2) \frac{2a^2}{b} (3) \frac{3a^2}{b} (4) \frac{4a^2}{b}$$

3. A projectile is projected with velocity 20 m/s at an angle of  $53^\circ$  with horizontal. Radius of curvature of trajectory of projectile at the instant when its velocity is perpendicular to its initial velocity (1) 30 m (2) 22.5 m (3) 5 m (4) 225 m

4. Two particles A and B located in horizontal plane are projected with velocity  $V_1$  and  $V_2$  respectively as shown. if they collide during motion, then



$$\frac{d}{V} \frac{d}{V} (2) \frac{d^2}{V^2}$$

$$\frac{d}{V} \frac{d}{V} \frac{d}{V} \frac{d}{V} (2) \frac{d^2}{V^2}$$

$$\frac{d}{V} \frac{d}{V} (3) \frac{d^2}{V^2}$$

$$\frac{d}{V} \frac{d}{V} \frac{d}{V} \frac{d}{V} (4) \frac{d^2}{V^2}$$

$$(1) \frac{d^2}{V^2}$$

$$\frac{d}{V} \frac{d}{V} \frac{d}{V} \frac{d}{V} (2) \frac{d^2}{V^2}$$

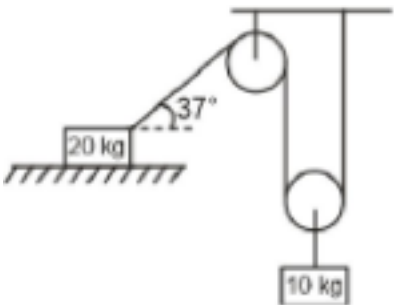
$$\frac{d}{V} \frac{d}{V} \frac{d}{V} \frac{d}{V}$$

$$\frac{d}{V} \frac{d}{V} \frac{d}{V} \frac{d}{V}$$

Rough Work



5. For the system shown, strings and pulleys are ideal. If the system is just in the equilibrium, then coefficient of friction between 20 kg block and surface, is

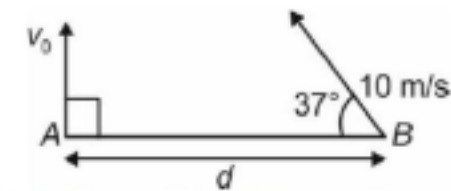


$$(1) \frac{2}{17} (2) \frac{3}{17} (3) \frac{6}{17} (4) \frac{4}{17}$$

6. A particle moving in XY plane with constant speed  $v_0$  along the trajectory  $x^2 = 4ay$ . Acceleration of particle at origin is

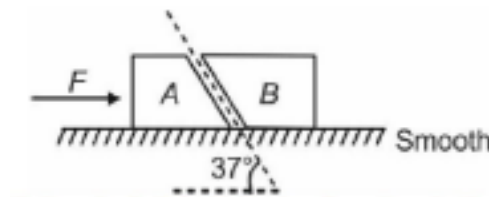
7. In the figure shown, both particles A and B projected from

horizontal level with velocities shown in graph. If they collide after some time, then velocity  $v_0$  is



(1) 6 m/s (2) 8 m/s (3) 15 m/s (4) 10 m/s

8. Force  $F = 10 \text{ N}$  is applied on block. Mass of A is equal to that of mass of B. If all the surfaces are smooth then contact force between A and B is



(1)  $\frac{25}{3} \text{ N}$  (2) 5 N (3) 10 N (4) 6.25 N