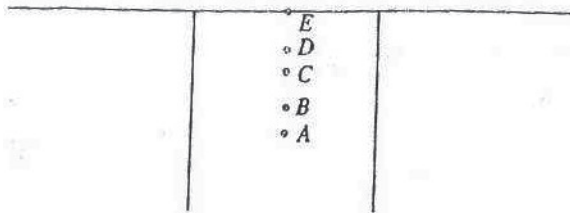


Multiple Choice Questions

1.

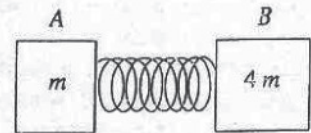


The frame shown in the figure is made from a uniform wire. The centre of gravity of the frame is most likely to be found at

- (1) A.
- (2) B.
- (3) C.
- (4) D.
- (5) E.

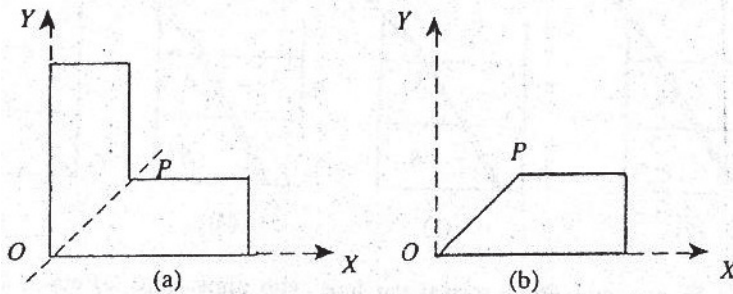
2.

Two masses m and $4m$ lying on a smooth table are compressed against a spring as shown in the figure. As the masses are released the speeds of masses, V_A and V_B , are related by



- (1) $V_A = V_B$
- (2) $V_A = 2V_B$
- (3) $V_A = 4V_B$
- (4) $2V_A = V_B$
- (5) $4V_A = V_B$

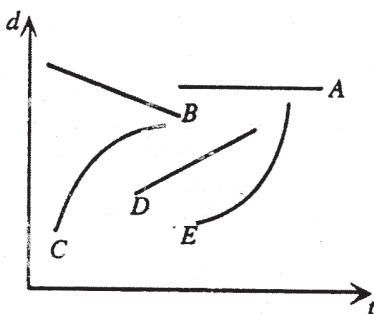
3.



The co-ordinates of the centre of gravity of a uniform sheet of cardboard shown in fig. (a) are (x_0, y_0) . The cardboard is now folded along OP as shown in fig. (b). The centre of gravity of the folded cardboard has co-ordinates (x, y) where

- (1) $x = x_0 ; y = y_0$
- (2) $x < x_0 ; y < y_0$
- (3) $x > x_0 ; y > y_0$
- (4) $x > x_0 ; y < y_0$
- (5) $x < x_0 ; y > y_0$

4.



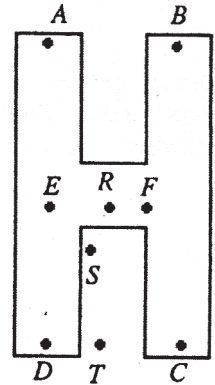
The diagram shows five displacement (d) time (t) graphs for five objects. Which represents an object accelerating in the direction of motion?

- (1) By A
- (2) By B
- (3) By C
- (4) By D
- (5) By E

5. A 5×10^{-2} kg lump of clay that is moving at a velocity of 10 ms^{-1} in a horizontal direction to the left strikes a 6×10^{-2} kg lump of clay moving in the same horizontal direction to the right at a velocity of 12 ms^{-1} . The two lumps stick together after they collide. The composite object will move at a velocity of
 (1) 0. (2) 1 ms^{-1} (3) 2 ms^{-1} (4) 11 ms^{-1} (5) 22 ms^{-1}

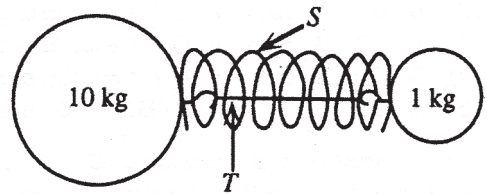
6. When the H shaped object shown in the diagram was hung from point B, point D was located directly below B. When it was hung from E, point C was located directly below E. What is the most probable location of the centre of gravity?

- (1) E (2) Q
 (3) R (4) S
 (5) T

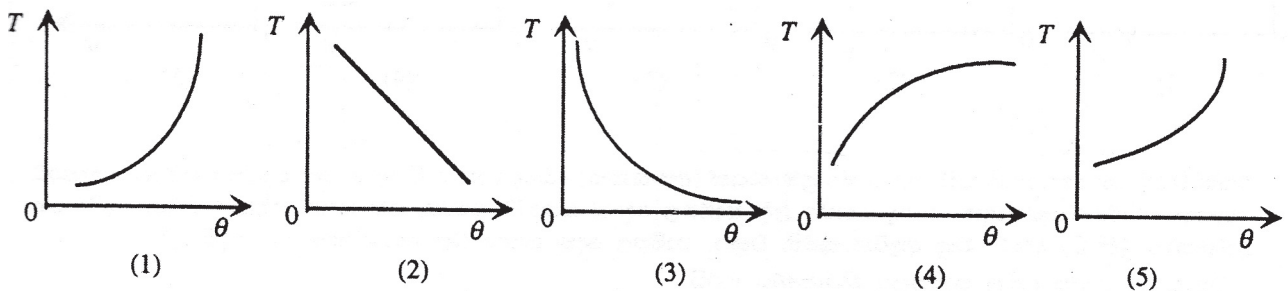
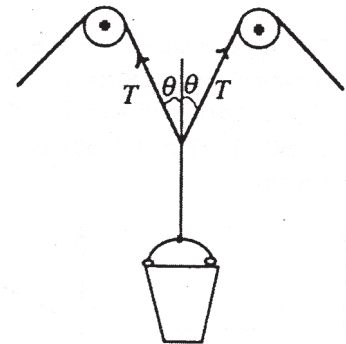


7. In the given diagram, S is a compressed, light spring located between two masses and the two masses are held together by string T. When the string was cut, the 1 kg mass moves away with 20 ms^{-1} , then the 10 kg mass moves with,

- (1) 20 ms^{-1} velocity
 (2) 10 ms^{-1} velocity
 (3) 2 ms^{-1} velocity
 (4) $20/11 \text{ ms}^{-1}$ velocity
 (5) 1 ms^{-1} velocity



8. The diagram shows how two children draw a water bucket from a well. Which of the following graphs correctly shows the variation of the tension of the strings T, with the θ angle shown in the diagram?

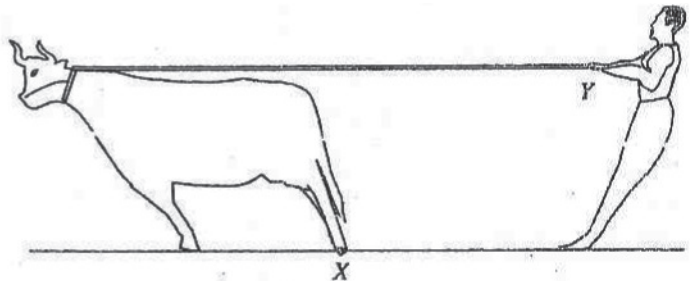


9. The object A of mass m and velocity u moving on a smooth horizontal surface along positive x direction makes a perfectly elastic collision with an identical object B which is at rest as shown in the figure. After the collision, the velocities of A and B are,



- (1) 0, and u along positive x direction respectively.
- (2) $\frac{u}{2}$ along positive x direction, and $\frac{u}{2}$ along positive x direction respectively.
- (3) $\frac{u}{2}$ along negative x direction, and $\frac{u}{2}$ along positive x direction respectively.
- (4) u along negative x direction, and 0 respectively.
- (5) 0, and $\frac{u}{2}$ along positive x direction respectively.

10. Figure shows an attempt made by a man to hold a bull tied to a rope trying to escape. The force at X acting on the bull's leg is F_L and that on the ground is F_G . The force at Y acting on the rope is F_R and that on the hand of the man is F_H . The forces F_L , F_G , F_R and F_H are correctly represented by



| | (1) | (2) | (3) | (4) | (5) |
|------|-----|-----|-----|-----|-----|
| At X | | | | | |
| At Y | | | | | |