

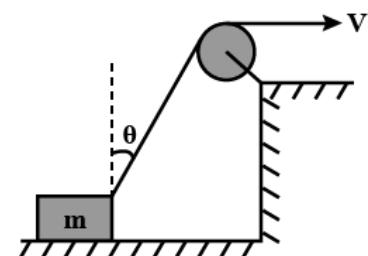


## DPP - 4

## NLM

**Q.1** A block is dragged on smooth plane with the help of a rope which moves with velocity  $v$ . The horizontal velocity of the block is :

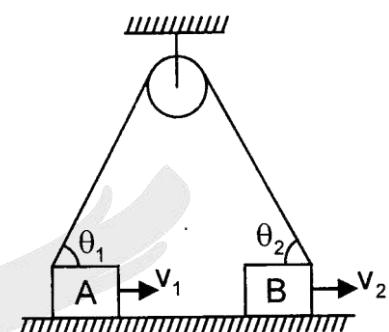
- (A)  $v$
- (B)  $\frac{v}{\sin \theta}$
- (C)  $v \sin \theta$
- (D)  $\frac{v}{\cos \theta}$



**Q.2** In the figure shown, blocks A and B move with velocities  $v_1$  and  $v_2$  along horizontal direction.

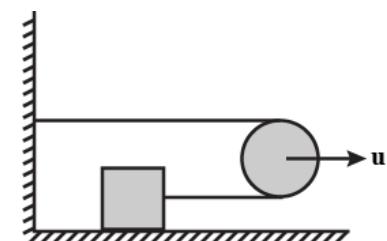
The ratio of  $\frac{v_1}{v_2}$  :

- (A)  $\frac{\sin \theta_2}{\sin \theta_1}$
- (B)  $\frac{\sin \theta_1}{\sin \theta_2}$
- (C)  $\frac{\cos \theta_2}{\cos \theta_1}$
- (D)  $\frac{\cos \theta_1}{\cos \theta_2}$



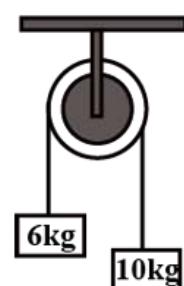
**Q.3** In the figure shown, the pulley is moving with velocity  $u$ . The velocity of the block attached with string:

- (A)  $4u$
- (B)  $3u$
- (C)  $u$
- (D)  $2u$



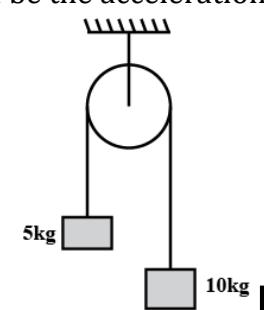
**Q.4** A light string passes over a frictionless pulley. To one of its ends a mass of 6 kg is attached and to its other end a mass of 10 kg is attached. The tension in the string will be -

- (A) 50 N
- (B) 75 N
- (C) 100 N
- (D) 150 N



**Q.5** Two masses of 5 kg and 10 kg are connected to a pulley as shown. What will be the acceleration if the pulley is set free? [ $g$  = acceleration due to gravity]

- |                   |                   |
|-------------------|-------------------|
| (A) $g$           | (B) $\frac{g}{2}$ |
| (C) $\frac{g}{3}$ | (D) $\frac{g}{4}$ |



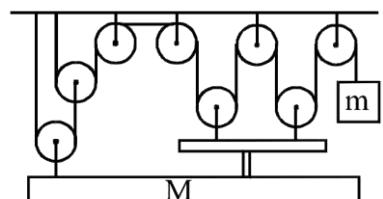
- Q.6** The minimum value of mass  $m$  required to lift the load  $M$  shown in figure is

(A)  $\frac{M}{8}$

(B)  $\frac{M}{4}$

(C)  $\frac{M}{16}$

(D)  $M$



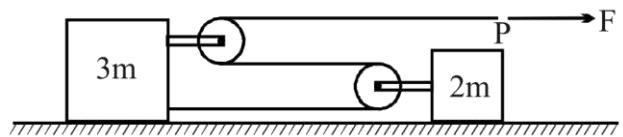
- Q.7** In the setup shown, blocks of masses  $3m$  and  $2m$  are placed on frictionless horizontal ground and the free end P of the thread is being pulled by a constant force  $F$ . Find acceleration of the free end P.

(A)  $\frac{F}{5m}$

(B)  $\frac{2F}{m}$

(C)  $\frac{3F}{m}$

(D)  $\frac{5F}{m}$



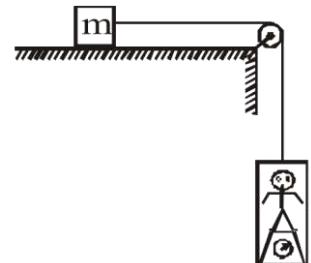
- Q.8** In the figure, a man of true mass  $M$  is standing on a weighing machine placed in a cabin. The cabin is joined by a string with a body of mass  $m$ . Assuming no friction, and negligible mass of cabin and weighing machine, the measured mass of man is

(A)  $\frac{Mm}{M+m}$

(B)  $\frac{Mm}{M-m}$

(C)  $M$

(D) depends on  $g$



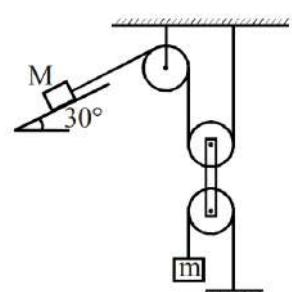
- Q.9** In the arrangement shown, neglect the mass of the ropes and pulley. What must be the value of  $m$  to keep the system in equilibrium? There is no friction anywhere.

(A) 1

(B)  $2M$

(C)  $\frac{M}{2}$

(D)  $\frac{M}{4}$



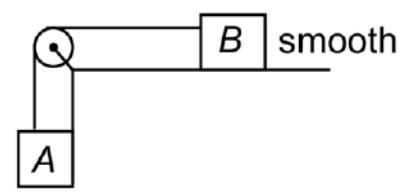
- Q.10** Two blocks whose sum of masses is  $1\text{ kg}$  were arranged as shown. Acceleration of blocks is twice, when A is hanging than when B is hanging, the mass of A is  
(neglect friction)

(A)  $\frac{1}{3}\text{ kg}$

(B)  $\frac{1}{4}\text{ kg}$

(C)  $\frac{2}{5}\text{ kg}$

(D)  $\frac{2}{3}\text{ kg}$

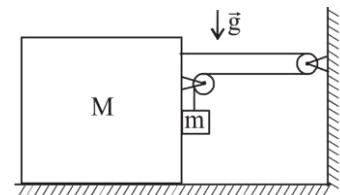
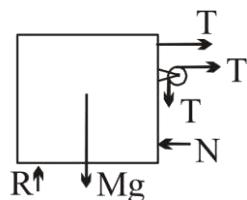




**Q.11** Mark the correct option(s) after the system shown is released from rest (assume all surfaces to be frictionless).

- (A) 'm' will go down because of which 'M' goes to the right.
- (B) 'm' will go up because of which 'M' goes to the right.
- (C) 'M' will push 'm' to the right.

(D) FBD of 'M' will be



### ANSWER KEY

- |        |        |         |           |        |        |        |
|--------|--------|---------|-----------|--------|--------|--------|
| 1. (B) | 2. (C) | 3. (D)  | 4. (B)    | 5. (C) | 6. (A) | 7. (D) |
| 8. (A) | 9. (C) | 10. (D) | 11. (ACD) |        |        |        |