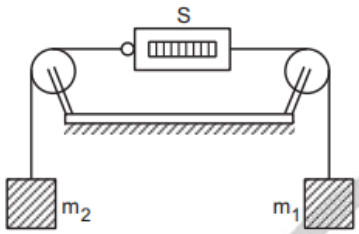
ARJUNA (NEET)

Newton's Law of Motion

DPP-05

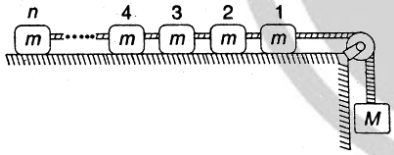
1. In the arrangement shown, the pulleys are fixed and ideal, the string are light, $m_1 > m_2$ and S is a spring balance which is itself massless. The reading of S (in units of mass) is



(A) $m_1 - m_2$ (B) $1/2\ (m_1 + m_2)$

(C) $\frac{m_1 m_2}{m_1 + m_2}$ (D) $\frac{2m_1 m_2}{m_1 + m_2}$

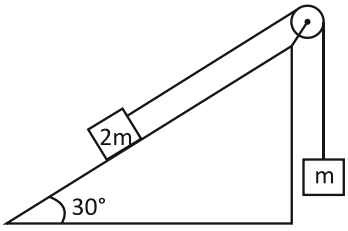
2. In the given arrangement, n number of equal masses are connected by strings of negligible masses. The tension in the string connected to nth mass is



(A) $\frac{mMg}{nm+M}$ (B) $\frac{mMg}{nmM}$

(C) mg (D) mng

3. For the arrangement shown in the figure, the tension is the string is given by



(A) $mg/2$ (B) mg

(C) $3mg/2$ (D) $2mg$

4. A man goes up in a uniformly accelerating lift. He returns downward with the lift accelerating at the same rate. The ratio of apparent weighs in the two cases is 2 : 1. The acceleration of the lift is

(A) $g/3$ (B) $g/4$

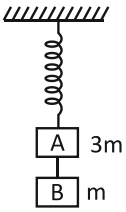
(C) $g/5$ (D) $g/6$

5. A man is at rest in the middle of a pond on perfectly smooth ice. He can get himself to the shore by making use of Newton's

(A) First law (B) Second law

(C) Third law (D) All the laws

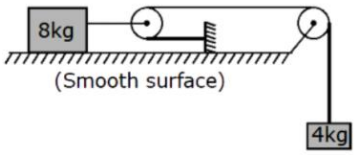
6. Two blocks A and B of masses 3 m and m, respectively, arc connected by a mass-less and inextensible string. The whole system is suspended by a mass-less spring as shown in figure. The magnitudes of acceleration of A and B immediately after the string is cut are, respectively.



(A) $\frac{g}{3}, g$ (B) g, g

(C) $\frac{g}{3}, \frac{g}{3}$ (D) $g, \frac{g}{3}$

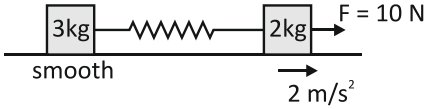
7. If pulleys shown in the diagram are smooth and massless and a_1 and a_2 are acceleration of blocks of mass 4 kg and 8 kg respectively, then



(A) $a_1 = a_2$ (B) $a_1 = 2a_2$

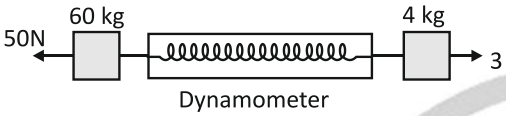
(C) $2a_1 = a_2$ (D) $a_1 = 4a_2$

8. What is the acceleration of 3 kg mass when acceleration of 2 kg mass is 2 m/s^2 as shown?



(A) 3 m/s^2 (B) 2 m/s^2
(C) 0.5 m/s^2 (D) Zero

9. A dynamometer *D* is attached to two blocks of masses 6 kg and 4 kg as shown in the figure. The reading of the dynamometer is



(A) 18 N (B) 28 N
(C) 38 N (D) 48 N

10. A small metallic sphere of mass m is suspended from the ceiling of a car accelerating on a horizontal road with constant acceleration *a*. The tension in the string attached with metallic sphere is

(A) mg (B) $m(g + a)$
(C) $m(g - a)$ (D) $m\sqrt{g^2 + a^2}$

ANSWER KEY

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

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