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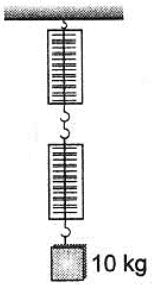
DPP - 3

Q.1 A block of mass 10 kg is suspended through two light spring balances as shown in figure. Reading of springs is K_1 and K_2 then value of K_1+K_2 is _ _ _ _



Q.2 A spring balance and a physical balance are kept in a lift. In these balances equal masses are placed. If now the lift starts moving upwards with constant acceleration, then

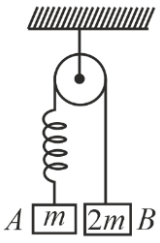
(A) The reading of spring balance will increase and the equilibrium position of the physical balance will disturb

(B) The reading of spring balance will remain unchanged and physical balance will remain in equilibrium

(C) The reading of spring balance will decrease and physical balance will remain in equilibrium

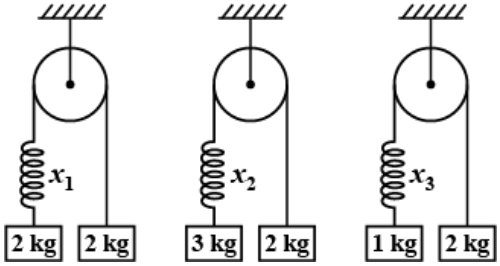
(D) The reading of spring balance will increase and the physical balance will remain in equilibrium

Q.3 A block ' A ' of mass ' m ' is attached at one end of a light spring and the other end of the spring is connected to another block ' B ' of mass 2 m through a light string as shown in the figure. ' A ' is held and B is in static equilibrium. Now A is released. The acceleration of A just after that instant is ' a '. In the next case, B is held and A is in static equilibrium. Now when B is released, its acceieration immediately after the release is ' b '. The value of a/b is: (Pulley, string and the spring are massless)



(A) 0 (B) undefined (C) 2 (D) $\frac{1}{2}$

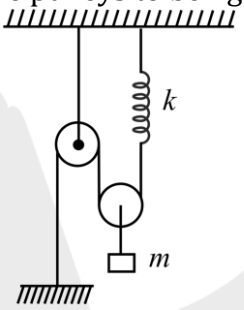
Q.4 Same spring is attached with 2 kg, 3 kg and 1 kg blocks in three different cases as shown in figure. If x_1, x_2 and x_3 be the extensions in the spring in these cases then (Assume all the blocks to move with uniform acceleration)



(A) $x_1 = 0, x_3 > x_2$ (B) $x_2 > x_1 > x_3$

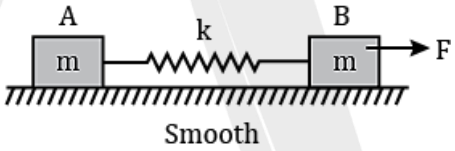
(C) $x_3 > x_1 > x_2$ (D) $x_1 > x_2 > x_3$

Q.5 Mass m shown in the figure is in equilibrium. If it is displaced further by x and released find its acceleration just after it is released. Take pulleys to be light and smooth and strings light.



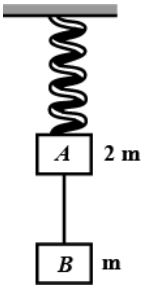
(A) $\frac{4kx}{5m}$ (B) $\frac{2kx}{5m}$ (C) $\frac{4kx}{m}$ (D) none of these

Q.6 Initially the spring is undeformed. Now the force F is applied to B as shown in the figure. When the displacement of B w.r.t. A is x towards right in some time then the relative acceleration of B w.r.t. A at that moment is:



(A) $\frac{F}{2m}$ (B) $\frac{F-kx}{m}$ (C) $\frac{F-2kx}{m}$ (D) none of these

Q.7 Two blocks A and B of masses 2m and m, respectively, are connected by a rnassless and inextensible string. The whole system is suspended by a massless spring as shown in the figure. The magnitudes of acceleration of A and B immediately after the string is cut, are respectively:



(A) $g, \frac{g}{2}$ (B) $\frac{g}{2}, g$ (C) g, g (D) $\frac{g}{2}, \frac{g}{2}$

Q.8 The block shown in the figure is in equilibrium. Find acceleration of the block just after the string is cut.

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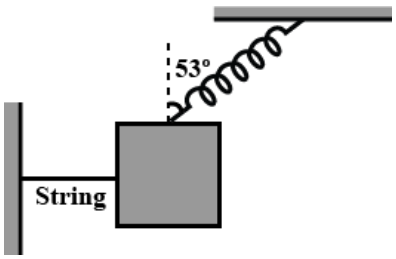
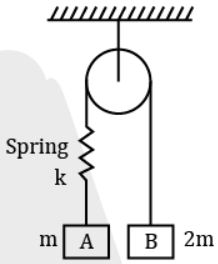


(A) 3g/5 (B) 4g/5 (C) 4g/3 (D) None

Q.9 Two block's A and B of masses m and 2m respectively are held at rest such that the spring is in natural length. Find out the accelerations of blocks A and B respectively just after release (pulley, string and spring are massless).



(A) g ↓, g ↓ (B) $\frac{g}{3}$ ↓, $\frac{g}{3}$ ↑ (C) 0,0 (D) g ↓ ,0

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ANSWER KEY

1. 20 **2.** (D) **3.** (C) **4.** (B) **5.** (C) **6.** (C) **7.** (B)
8. (C) **9.** (A)