Physicsaholics

DPP - 4

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Q 1. If a bullet of mass 5 gm moving with velocity 100 m /sec, penetrates the wooden block upto 6 cm. Then the average force imposed by the bullet on the block is

(a) 8300 N (b) 417 N

(c) 830 N (d) zero

Q 2. A vehicle of 100 kg is moving with a velocity of 5 m/sec. To stop it in $\frac{1}{10}$ sec, the required force in opposite direction is:

(a) 5000 N (b) 500 N

(c) 50 N (d) 1000 N

Q 3. A block of mass 5kg is moving horizontally at a speed of 1.5 m/s. A perpendicular force of 5N (in horizontal plane) acts on it for 4 sec. What will be the distance of the block from the point where the force started acting:

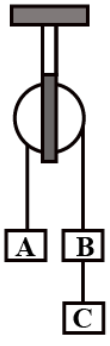
(a) 10 m (b) 8 m

(c) 6 m (d) 2 m

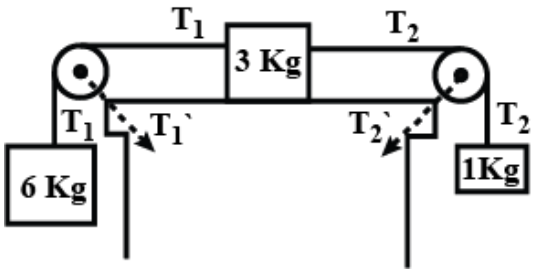
Q 4. Three equal weights of mass 2 kg each are hanging on a string passing over a fixed pulley as shown in the fig. What is the tension in the string connecting the weights B and C? ($g = 9.8\ m/s^2$)

(a) zero (b) 13 N

(c) 303 N (d) 19.6 N

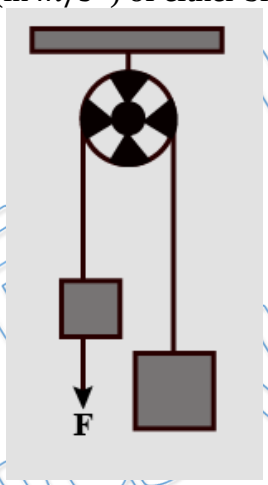


Q 5. A system of three blocks are connected by strings as shown in figure. Calculate acceleration of each block and tension in the strings: ($g = 10\ m/s^2$)



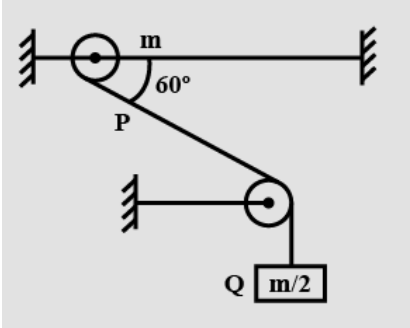
(a) $a = 5\ m/s^2, T_1 = 30N, T_2 = 15N$
(b) $a = 5\ m/s^2, T_1 = 15N, T_2 = 30N$
(c) $a = 2.5\ m/s^2, T_1 = 40N, T_2 = 20N$
(d) $a = 2.5\ m/s^2, T_1 = 20N, T_2 = 40N$

Q 6. Two unequal masses of 1kg and 2kg are connected by an inextensible light string passing over a smooth pulley as shown in the figure. A force F=20N is applied on 1kg block. Find the acceleration (in m/s^2) of either block: ($g = 10\ m/s^2$)



(a) $\frac{10}{3}$ (b) $\frac{20}{3}$
(c) 10 (d) 20

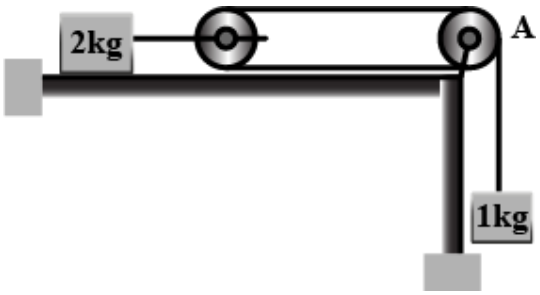
Q 7. A smooth ring P of mass m can slide on a fixed horizontal rod. A string tied to the ring passes over a fixed pulley and carries a block Q of mass (m/2) as shown in the figure. At an instant, the string between the ring and the pulley makes an angle 60^0 with the rod. The initial acceleration of the ring is:



(a) $\frac{2g}{9}$ (b) $\frac{g}{6}$

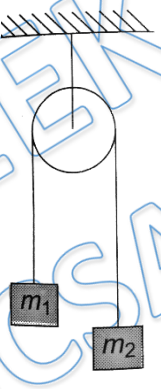
(c) $\frac{2g}{6}$ (d) $\frac{g}{3}$

Q 8. Consider the situation shown in figure. Both the pulleys and the string are light and all the surfaces are smooth. Find the tension in the string attached with 1kg block: ($g = 10\ m/s^2$)



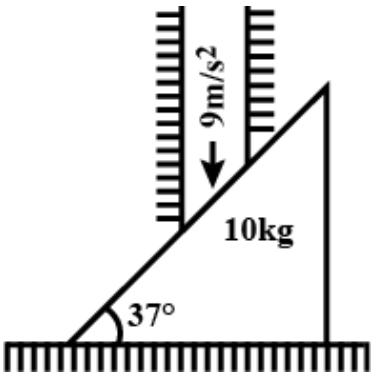
(a) $\frac{20}{3}N$ (b) $\frac{5}{3}\ N$ (c) $\frac{40}{3}\ N$ (d) $\frac{10}{3}\ N$

Q 9. Two masses $m_1 = 5\ kg$ and $m_2 = 10\ kg$ are connected at the ends of an inextensible string passing over a frictionless pulley as shown. When the masses are released, then the acceleration of the masses will be:



(a) g (b) $\frac{g}{2}$ (c) $\frac{g}{3}$ (d) $\frac{g}{4}$

Q 10. System is shown in figure. All the surfaces are smooth. Rod is moved by external agent with acceleration $9\ m/s^2$ vertically downwards. Force exerted on the rod by the wedge will be:



(a) $120\ N$
(b) $200\ N$

(c) $\frac{135}{2}\ N$

(d) $\frac{225}{2} N$

Q 11. A person of mass 50 kg stands on a weighing scale on a lift . If the lift is descending with a downward acceleration of $9 m/s^2$. what would be the reading of the weighing scale? ($g = 10\ m/s^2$)

(a) $50\ kg$ (b) $25\ kg$

(c) $250\ kg$ (d) $5\ kg$

Answer Key

Q.1 b	**Q.2 a**	**Q.3 a**	**Q.4 b**	**Q.5 a**
Q.6 a	**Q.7 a**	**Q.8 d**	**Q.9 c**	**Q.10 b**
Q.11 d				