NEET

Yakeen NEET 2.0 2026

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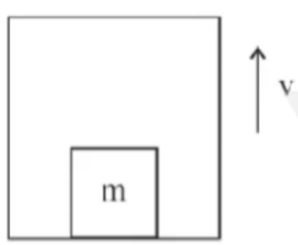
Laws of Motion

DPP: 6

Q1 A block can slide on a smooth inclined plane of inclination θ kept on the floor of a lift. When the lift is descending with retardation a, the acceleration of the block relative to the incline is

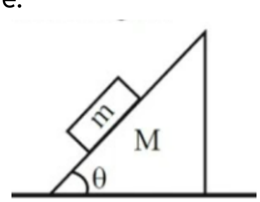
(A) $(g+a)\sin\theta$
(B) $(g-a)$
(C) $g\sin\theta$
(D) $(g-a)\sin\theta$

Q2 A block of mass m is placed on the floor of lift which is moving with velocity $\mathrm{v}=4\mathrm{t}^2$, where t is time in second and v is velocity in $\mathrm{m/s}$. Find the time at which normal force on the block is three times of its weight.



(A) $3\ \mathrm{g}/8\ \mathrm{s}$
(B) $\mathrm{g}/4\ \mathrm{s}$
(C) $4\ \mathrm{g\ s}$
(D) $3\ \mathrm{g\ s}$

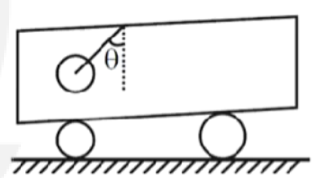
Q3 A block of mass m lies on wedge of mass M as shown in figure.



With what minimum acceleration must the wedge be moved towards right horizontally so that block m falls freely.

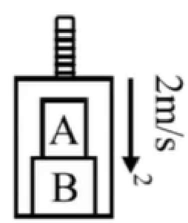
(A) $a=g\tan\theta$
(B) $a=g\cot\theta$
(C) $a=g\sin\theta$
(D) $a=g\cos\theta$

Q4 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



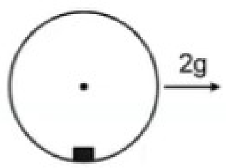
(A) mg
(B) $m(g+a)$
(C) $m(g-a)$
(D) $m\sqrt{g^2+a^2}$

Q5 The elevator shown in figure is descending, with an acceleration of $2\ \mathrm{m/s^2}$. The mass of the block A is $0.5\ \mathrm{kg}$. The force exerted by the block A on the block B is



(A) $2 \mathrm{~N}$
(B) $4 \mathrm{~N}$
(C) $6 \mathrm{~N}$
(D) $8 \mathrm{~N}$

Q6 A block of mass m is placed inside a smooth hollow cylinder of radius R whose axis is kept horizontally. Initially system was at rest. Now cylinder is given constant acceleration 2 g in the horizontal direction by external agent. The maximum angular displacement of the block with the vertical is:



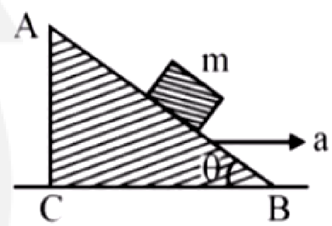
(A) $2 \tan^{-1} 2$
(B) $\tan^{-1} 2$
(C) $\tan^{-1} 1$
(D) $\tan^{-1}\left(\frac{1}{2}\right)$

Q7 In a rocket of mass $1000 \mathrm{~kg}$ fuel is consumed at a rate of $40 \mathrm{~kg/s}$. The velocity of the gases ejected from the rocket is $5 \times 10^4 \mathrm{~m/s}$. The thrust on the rocket is
(A) $2 \times 10^3 \mathrm{~N}$
(B) $5 \times 10^4 \mathrm{~N}$
(C) $2 \times 10^6 \mathrm{~N}$
(D) $2 \times 10^9 \mathrm{~N}$

Q8 A balloon has 2 g of air. A small hole is pierced into it. The air comes out with a velocity of $4 \mathrm{~m/s}$. If the balloon shrinks completely in 2.5 s. The average force acting on the balloon is
(A) $0.008 \mathrm{~N}$
(B) $0.0032 \mathrm{~N}$
(C) $8 N$
(D) $3.2 \mathrm{~N}$

Q9 A block of mass m is placed on a smooth wedge of inclination θ. The whole system is accelerated horizontally so that the block does not slip on the wedge. The force exerted by the wedge on the block will be (g is acceleration due to gravity)
(A) $mg \cos \theta$
(B) $mg \sin \theta$
(C) mg
(D) $mg / \cos \theta$

Q10 A block of mass m is placed on a smooth inclined wedge ABC of inclination θ as shown in the figure. The wedge is given an acceleration a towards the right. The relation between a and θ for the block to remain stationary on the wedge is:-



(A) $a = \frac{g}{\operatorname{cosec} \theta}$
(B) $a = \frac{g}{\sin \theta}$
(C) $a = g \cos \theta$
(D) $a = g \tan \theta$

Answer Key

Q1	(A)
Q2	(B)
Q3	(B)
Q4	(D)
Q5	(B)
Q6	(A)
Q7	(C)
Q8	(B)
Q9	(D)
Q10	(D)