

NEET LAWS OF MOTION — STATIC, KINETIC AND ROLLING FRICTION — PYQS

Max. Marks: 44

Questions: 11

Section A (MCQ) — 11 questions

Q.1 A box of mass 15 kg is kept on the floor of a stationary trolley. The coefficient of static friction between the box and the trolley is 0.12. Keeping the box in stationary state over the trolley, the maximum acceleration with which the trolley can be moved horizontally in m s^{-2} is :

($g = 10 \text{ m/s}^2$) [NEET (UG) 2026]

- (1) 1.8 (2) 1.2 (3) 1.5 (4) 2.1

Scan or tap for the full solution



Q.2 There are two inclined surfaces of equal length (L) and same angle of inclination 45° with the horizontal. One of them is rough and the other is perfectly smooth. A given body takes 2 times as much time to slide down on rough surface than on the smooth surface. The coefficient of kinetic friction (μ_k) between the object and the rough surface is close to

[NEET (UG) 2025]

- (1) 0.5 (2) 0.75 (3) 0.25 (4) 0.40

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Q.3 Calculate the maximum acceleration of a moving car so that a body lying on the floor of the car remains stationary. The coefficient of static friction between the body and the floor is 0.15 ($g = 10 \text{ m/s}^2$).

[NEET (UG) 2023]

- (1) 150 m/s^2 (2) 1.5 m/s^2
 (3) 50 m/s^2 (4) 1.2 m/s^2

Scan or tap for the full solution



Q.4 Which one of the following statements is incorrect?

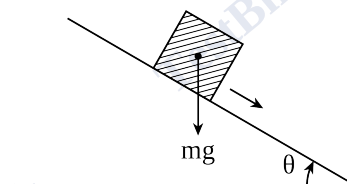
[NEET 2018]

- (1) Rolling friction is smaller than sliding friction.
 (2) Limiting value of static friction is directly proportional to normal reaction.
 (3) Frictional force opposes the relative motion.
 (4) Coefficient of sliding friction has dimensions of length.

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Q.5 A plank with a box on it at one end is gradually raised about the other end. As the angle of inclination with the horizontal reaches 30° , the box starts to slip and slides 4.0 m down the plank in 4.0 s.



The coefficients of static and kinetic friction between the box and the plank will be, respectively

[AIPMT 2015]

- (1) 0.5 and 0.6 (2) 0.4 and 0.3
 (3) 0.6 and 0.6 (4) 0.6 and 0.5

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Q.6 A conveyor belt is moving at a constant speed of 2 m/s . A box is gently dropped on it. The coefficient of friction between them is $\mu = 0.5$. The distance that the box will move relative to belt before coming to rest on it, taking $g = 10 \text{ m/s}^2$, is

[AIPMT 2011 (Mains)]

- (1) 0.4 m (2) 1.2 m (3) 0.6 m (4) zero

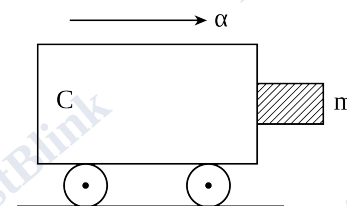
Scan or tap for the full solution



Q.7 A block of mass m is in contact with the cart C as shown in the figure.

The coefficient of static friction between the block and the cart is μ . The acceleration α of the cart that will prevent the block from falling satisfies

[AIPMT 2010 (Prelims)]



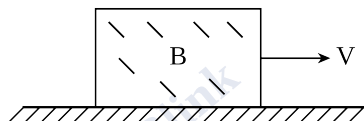
- (1) $\alpha > \frac{mg}{\mu}$ (2) $\alpha > \frac{g}{\mu}$
 (3) $\alpha \geq \frac{g}{\mu}$ (4) $\alpha < \frac{g}{\mu}$

Scan or tap for the full solution



- Q.8** A block B is pushed momentarily along a horizontal surface with an initial velocity V . If μ is the coefficient of sliding friction between B and the surface, block B will come to rest after a time

[AIPMT 2007]



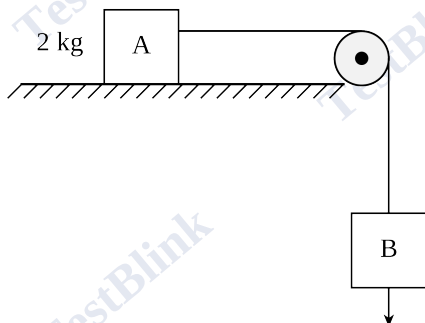
- (1) $g\mu/V$ (2) g/V (3) V/g (4) $V/(g\mu)$

Scan or tap for the full solution



- Q.9** The coefficient of static friction, μ_s , between block A of mass 2 kg and the table as shown in the figure is 0.2. What would be the maximum mass value of block B so that the two blocks do not move? The string and the pulley are assumed to be smooth and massless. ($g = 10 \text{ m/s}^2$)

[AIPMT 2004]



- (1) 2.0 kg (2) 4.0 kg (3) 0.2 kg (4) 0.4 kg

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- Q.10** A block of mass 10 kg placed on rough horizontal surface having coefficient of friction $\mu = 0.5$, if a horizontal force of 100 N acting on it then acceleration of the block will be

[AIPMT 2002]

- (1) 10 m/s^2 (2) 5 m/s^2 (3) 15 m/s^2 (4) 0.5 m/s^2

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- Q.11** On the horizontal surface of a truck a block of mass 1 kg is placed ($\mu = 0.6$) and the truck is moving with acceleration 5 m/s^2 , then the frictional force on the block will be

[AIPMT 2001]

- (1) 5 N (2) 6 N (3) 5.88 N (4) 8 N

Scan or tap for the full solution



ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	2	2	2	4	4	1	3	4	4	2	1