

Work, Energy and Power

NEET previous year questions · Physics

3 questions from the official papers: NEET 2026 (1), Re-NEET 2026 (2). Each is followed by its answer and a worked solution written by BrainIt. Generated on 23 October 2026.



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1. NEET 2026 · Q24

The power of a crane, which lifts a mass of 1000 kg to a height of 20 m in 10 s is: ($g = 9.8 \text{ m/s}^2$)

- (1) 19.6 W (2) 39.2 W (3) 19.6 kW (4) 39.2 kW

Answer (3)

Sol. The useful power is work done against gravity divided by time, $P = \frac{mgh}{t}$. Substituting, $P = \frac{1000 \times 9.8 \times 20}{10} = 19600 \text{ W} = 19.6 \text{ kW}$ (option (3)). The 19.6 W answer drops a factor of 1000, and the 39.2 values double-count g or the height.

2. Re-NEET 2026 · Q1

A particle of mass M moves along a horizontal x axis from $x = 0$ to $x = L$. The coefficient of kinetic friction varies as a function of x as $\mu_k(x) = \mu_0 - \alpha x$, where μ_0, α are constants of appropriate dimensions, so that $\mu_k(L) = 0$. The total work done by the frictional force during the motion is $n\mu_0 MgL$, where g is the acceleration due to gravity. The value of n is:

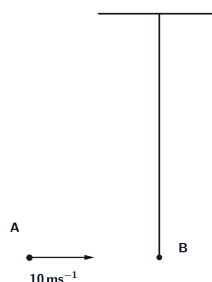
- (1) 3 (2) 1 (3) $\frac{1}{3}$ (4) $\frac{1}{2}$

Answer (4)

Sol. The condition $\mu_k(L) = 0$ fixes $\alpha = \mu_0/L$, so $\mu_k(x) = \mu_0 \left(1 - \frac{x}{L}\right)$ falls linearly from μ_0 to zero. Because the force varies with position, the work must be integrated: $|W| = \int_0^L \mu_k(x) Mg dx = \mu_0 Mg \left[L - \frac{L}{2}\right] = \frac{1}{2} \mu_0 MgL$. Comparing with $n\mu_0 MgL$ gives $n = 1/2$, which is simply the average of the initial and final friction coefficients since the variation is linear. NCERT Class 11, Work, Energy and Power (work done by a variable force).

3. Re-NEET 2026 · Q44

Bob B of mass m at rest is hanging vertically from the ceiling via a massless string of length 10 m, as shown in the figure. Point mass A of mass m travelling horizontally with speed 10 ms^{-1} hits bob B elastically. The bob B rises h meter after the collision. Taking the acceleration due to gravity $g = 10 \text{ ms}^{-2}$ and neglecting the size of the bob, the value of h is:



- (1) 8 (2) 7 (3) 5 (4) 2.5

Answer (3)

Sol. In a head-on ELASTIC collision between equal masses the velocities are simply exchanged, so A stops dead and B leaves the collision at the full 10 ms^{-1} . Energy conservation on the swing then gives $h = \frac{v^2}{2g} = \frac{100}{20} = 5 \text{ m}$. The bob rises only 5 m, less than the 10 m string length, so it stays below the horizontal through the point of suspension and the string never goes slack. NCERT Class 11, Work, Energy and Power (collisions).

Why the other options are wrong:

- Option (1) (8 m) and option (2) (7 m) are higher than 5 m. Even if B took all the kinetic energy of A , it could rise only $\frac{v^2}{2g} = 5 \text{ m}$. A greater height needs energy the collision never supplied.
- Option (4) (2.5 m) gives B only half the kinetic energy of A , as if the energy were shared equally

between the two masses. That halves the height. In an elastic collision of equal masses, all of it passes to B .

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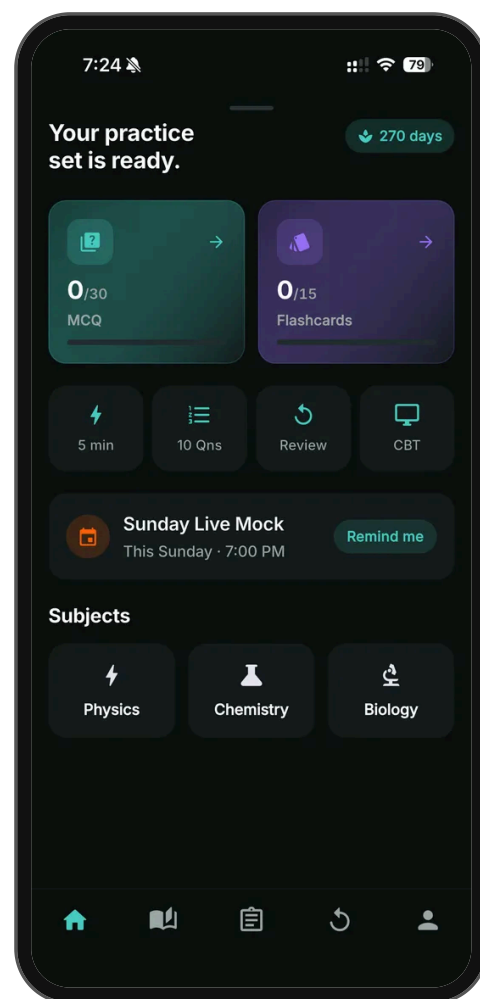
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