

PYQSide

JEE MAIN WORK, ENERGY AND POWER — WORK DONE BY CONSTANT AND VARIABLE FORCES — PYQS

Max. Marks: 20

Questions: 5

Section A (MCQ)

- Q.1** A mass of 1 kg is kept on an inclined plane with 30° inclination with respect to horizontal plane and it is at rest initially. Then the whole assembly is moved up with constant velocity of 4 m/s. The work done by the frictional force in time 2 s is _____ J. (Take $g = 10 \text{ m/s}^2$)

[JEE Main 2026 (Online) 5th April Evening Shift]

- (1) 20 (2) 25 (3) 30 (4) 10

Scan or tap for the full solution



- Q.2** A block of mass 25 kg is pulled along a horizontal surface by a force at an angle 45° with the horizontal. The friction coefficient between the block and the surface is 0.25. The block travels at a uniform velocity. The work done by the applied force during a displacement of 5 m of the block is :

[JEE Main 2025 (Online) 4th April Evening Shift]

- (1) 490 J (2) 970 J (3) 735 J (4) 245 J

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- Q.3** Two cylindrical vessels of equal cross sectional area of 2 m^2 contain water up to heights 10 m and 6 m, respectively. If the vessels are connected at their bottom then the work done by the force of gravity is (Density of water is 10^3 kg/m^3 and $g = 10 \text{ m/s}^2$)

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1)
- $1 \times 10^5 \text{ J}$
- (2)
- $4 \times 10^4 \text{ J}$
- (3)
- $8 \times 10^4 \text{ J}$
- (4)
- $6 \times 10^4 \text{ J}$

Scan or tap for the full solution



- Q.4** A block of mass 1 kg, moving along x with speed $v_i = 10 \text{ m/s}$ enters a rough region ranging from $x = 0.1 \text{ m}$ to $x = 1.9 \text{ m}$. The retarding force acting on the block in this range is $F_r = -kx$, with $k = 10 \text{ N/m}$. Then the final speed of the block as it crosses the rough region is:

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 4 m/s (2) 10 m/s (3) 8 m/s (4) 6 m/s

Scan or tap for the full solution



Section B (Numerical)

- Q.5** A 1 kg block subjected to two simultaneous forces $(2\hat{i} + 3\hat{j} + 4\hat{k}) \text{ N}$ and $(3\hat{i} - \hat{j} - 2\hat{k}) \text{ N}$ is moved a distance of 25 m along $(3\hat{i} - 4\hat{j})$ direction. The work done in this process is _____ J.

[JEE Main 2026 (Online) 4th April Morning Shift]

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ANSWER KEY

Section A (MCQ)

Ques.	1	2	3	4										
Ans.	1	4	3	3										

Section B (Numerical)

Ques.	5													
Ans.	35													