Yekeen NEET 2.0 (2026)

Physics by Saleem Sir

KPP - 26

Work, Energy and Power

Time Limit 01 Hour

Very easy ques. solve in (30 - 40) sec.

1. A particle moves along X-axis from $x = 0$ to $x = 1$ m under the influence of a force given by $F = (3x^2 + 2x - 10)$N. Work done by the force is

(1) + 4 J (2) – 4 J
(3) + 8 J (4) – 8 J

2. Two bodies of masses m_1 and m_2 are moving with same kinetic energy. If P_1 and P_2 are their respective momentum, the ratio $\frac{P_1}{P_2}$ is equal to:

(1) $\frac{m_1}{m_2}$ (2) $\sqrt{\frac{m_2}{m_1}}$
(3) $\sqrt{\frac{m_1}{m_2}}$ (4) $\frac{m_1^2}{m_2^2}$

3. A particle moves from position $\vec{r}_1 = 3\hat{i} + 2\hat{j} - 6\hat{k}$ to position $\vec{r}_2 = 14\hat{i} + 13\hat{j} + 9\hat{k}$ under the action of force $4\hat{i} + \hat{j} + 3\hat{k}$ N. The work done will be:

(1) 100 J (2) 50 J
(3) 200 J (4) 75 J

4. A force $(\vec{F}) = 3\hat{i} + c\hat{j} + 2\hat{k}$ acting on a particle causes a displacement $(\vec{s}) = -4\hat{i} + 2\hat{j} + 3\hat{k}$. If the work done by force $\vec{F}$ is 6J, then the value of 'c' is:

(1) 0 (2) 1
(3) 6 (4) 12

5. A body of mass 6 kg is moving under the action of force which causes displacement in it given by $S = \frac{t^2}{4}$ metres where t is time. The work done by the force in 2 seconds is:

(1) 12 J (2) 9 J
(3) 6 J (4) 3 J

6. A particle moves from position $\vec{r}_1 = 6\hat{i} + 4\hat{j} - 12\hat{k}$ to position $\vec{r}_2 = 12\hat{i} + 8\hat{j} - 6\hat{k}$ under the action of force $4\hat{i} + \hat{j} + 3\hat{k}$ N. The work done by this force will be

(1) 46 J (2) 50 J
(3) 200 J (4) 75 J

7. A ball is released from the top of a tower. The ratio of work done by force of gravity in first, second and third second of the motion of the ball is:

(1) 1 : 2 : 3 (2) 1 : 4 : 9
(3) 1 : 3 : 5 (4) 1 : 5 : 3

8. A constant force $\vec{F} = (3\hat{i} + 2\hat{j} + 2\hat{k})$N acts on a particle displacing it from a position $\vec{r}_1 = (-\hat{i} + \hat{j} - 2\hat{k})$m to a new position $\vec{r}_2 = (\hat{i} - \hat{j} + 3\hat{k})$m. Find the work done by the force.

9. An object is displaced from point A(2 m, 3 m, 4 m) to a point B(1 m, 2 m, 3 m) under a constant force $\vec{F} = (2\hat{i} + 3\hat{j} + 4\hat{k})$. Find the work done by this force in this process.

10. Three constant forces $\vec{F}_1 = 2\hat{i} - 3\hat{j} + 2\hat{k}$, $\vec{F}_2 = \hat{i} + \hat{j} - \hat{k}$, and $\vec{F}_3 = 3\hat{i} + \hat{j} - 2\hat{k}$ in newtons displace a particle from (1, –1, 2) to (–1, –1, 3) and then to (2, 2, 0) (displacement being measured in metres). Find the total work done by the forces.

11. The displacement of a particle of mass 1 kg on a horizontal smooth surface is a function of time given by $x = \frac{1}{3}t^3$. Find out the work done by the external agent for the first one second.

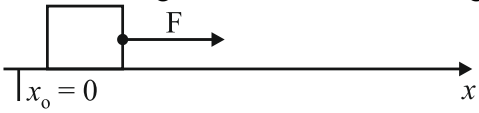
12. Consider a variable force F = (3x + 5) N acting on a body and if it is displaced from x = 2m to x = 4 m, calculate the work done by this force.

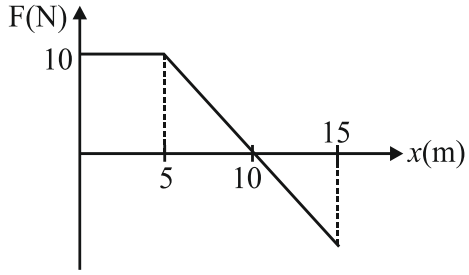
Ques. solve in (1 - 2) minute.

13. A force $\vec{F}=(3t\hat{i}+5\hat{j})$N acts on a body due to which its position varies as $\vec{S}=\left(2t^2\hat{i}-5\hat{j}\right)$. Work done by this force in first two seconds is:

(1) 23 J (2) 32 J
(3) zero (4) can't be obtained

14. A horizontal force F is used to pull a box placed on floor. Variation in the force with position coordinate x measured along the floor is shown in the graph.





(a) Calculate work done by the force in moving the box from x = 0 m to x = 10 m.
(b) Calculate work done by the force in moving the box from x = 10 m to x = 15 m.
(c) Calculate work done by the force in moving the box from x = 0 m to x = 15 m.

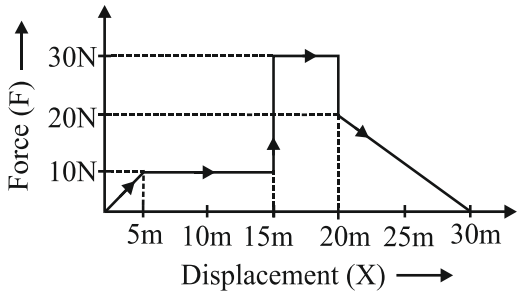
15. A force acting on a particle varies with the displacement x as F = $ax - bx^2$. Where a = 1 N/m and b = 1 N/m^2. The work done by this force for the first one meter (F is in newtons, x is in meters) is:

(1) $\frac{1}{6}$J (2) $\frac{2}{6}$J
(3) $\frac{3}{6}$J (4) None of these

16. A force $\vec{F}=(3x\hat{i}+4\hat{j})$ Newton (where x is in metres) acts on a particle which moves from a position (2 m, 3 m) to (3 m, 0 m). Then the work done is:

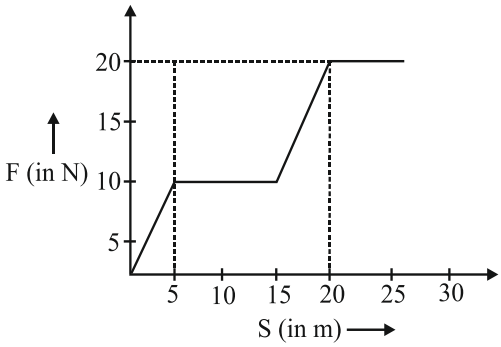
(1) 7.5 J (2) –12 J
(3) –4.5 J (4) +4.5 J

17. Given below is a graph between a variable force (F) (along y-axis) and the displacement (X) (along x-axis) of a particle is one dimension. The work done by the force in the displacement interval between 0 m and 30 m is:



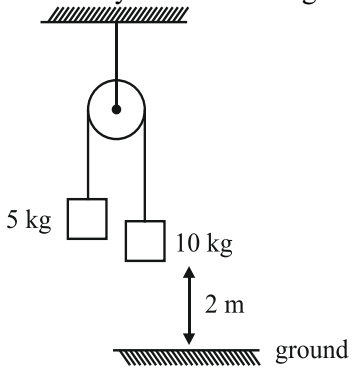
(1) 275 J (2) 375 J
(3) 400 J (4) 300 J

18. The work done by a force acting on a body is as shown in the graph. The total work done in covering an initial distance of 20 m is:



(1) 225 J (2) 200 J
(3) 400 J (4) 175 J

19. In the figure shown below, system is released from rest. When 10 kg block reaches ground then find
(i) Work done by gravity on 10 kg.
(ii) Work done by gravity on 5 kg.
(iii) Work done by tension on 10 kg.
(iv) Work done by tension on 5 kg.

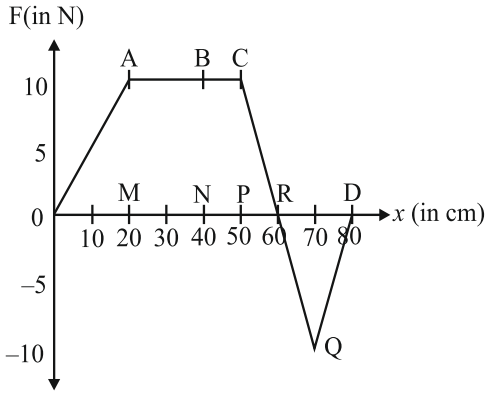


20. A force $\vec{F} = 6x\hat{i} + 2y\hat{j}$ displaces a body from $\vec{r}_1 = 3\hat{i} + 8\hat{j}$ to $\vec{r}_2 = 5\hat{i} - 4\hat{j}$. Find the work done by the force.

21. A block of mass 10 kg is slowly slid up on a smooth incline of inclination 37° by a person. Calculate the work done by the person in moving the block through a distance of 2.0 m, if the driving force is applied
(a) parallel to the incline
(b) in the horizontal direction

22. A force F = a + bx acts on a particle in x-direction, where a and b are constants. Find the work done by this force during the displacement from x_1 to x_2.

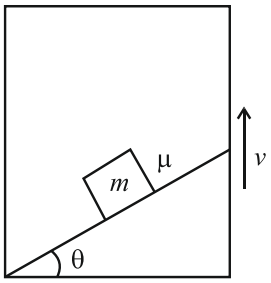
23. From the figure, find the work done at the end of displacements:
(a) 20 cm, (b) 80 cm.



24. An object is displaced from a point A(0, 0, 0) to B(1 m, 1 m, 1 m) under a force $\vec{F} = (y\hat{i} + x\hat{j})$N. Find the work done by this force in this process.

25. A block of mass 5 kg is being raised vertically upwards by the help of a string attached to it. It rises with an acceleration of 2 ms^{-2}. Find the work done by the tension in the string if the block rises by 2.5 m. Also find the work done by the gravity and the net work done.

26. An inclined plane is moving up with constant velocity v. A block kept on incline is at rest. Calculate the work done by gravity, friction force, and normal reaction on block in time interval of t.



27. An object is displaced from position vector $\vec{r}_1 = (2\hat{i} + 3\hat{j})$m to $\vec{r}_2 = (4\hat{i} + 6\hat{j})$m under a force $\vec{F} = \left(3x^2\hat{i} + 2y\hat{j}\right)$N. Find the work done by the force.

Answer Key

1. (4)
2. (3)
3. (1)
4. (3)
5. (4)
6. (1)
7. (3)
8. (12 J)
9. (– 9 J)
10. (5×10^{-5} J)
11. (0.5 J)
12. (28 J)
13. (2)
14. (a) 75 J; (b) –25 J; (c) 50 J
15. (1)
16. (3)
17. (2)
18. (2)
19. (i) 200 J; (ii) –100 J; (iii) $\frac{-400}{3}$ J ; (iv) $\frac{400}{3}$ J
20. (0 J)
21. (a) 120 J; (b) 120 J
22. $\frac{x_2 - x_1}{2}[2a + b(x_1 + x_2)]$
23. (a) 1 J; (b) 3.5 J
24. 1 J
25. –125 J; 25 J
26. $-mgvt$; $mgvt \sin^2\theta$; $mgvt \cos^2\theta$
27. 83 J