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Daily Practice Problems

NEET PHYSICS

Topic: Work, Power Energy

Q.1 A man pushes a wall and fails to displace it. He does -

(1) negative work (2) positive but not maximum work

(3) no work at all (4) maximum work

Q.2 A body travels through a distance of 10 m on a straight line, under the influence of 5 N . If the work done by the force is 25J, the angle between the force and displacement is-

(1) 0º (2) 30º (3) 60º (4) 90º

Q.3 A blocks is moved from rest through a distance of 4m along a straight line path. The mass of the blocks is 5 kg. and the force acting on it is 20 N . If the kinetic energy acquired by the block be 40J, at what angle to the path the force is acting-

(1) 30º (2) 60º (3) 45º (4)none of the above

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

(1) 7.5J (2) –12J

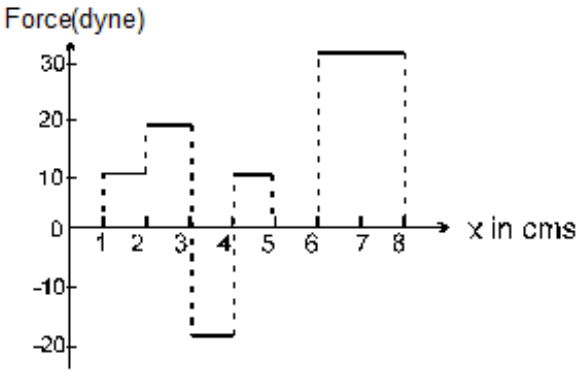
(3) –9 J (4) +4.5 J

Q.5 A chain of mass M is placed on a smooth table with 1/n of its length L hanging over the edge. The work done in pulling the hanging portion of the chain back to the surface of the table is -

(1) MgL/n (2) MgL/2n (3) MgL/n^2 (4) $MgL/2n^2$

Q.6 **The relationship between force and position is shown in fig (in one dimensional case). The work done in displacing a body from**

x = 1cm to x = 5 cm is :



(1) 20 erg **(2) 60 erg**

(3) 70 erg **(4) 700 erg**

Q.7 **A force** $\vec{F} = 2\hat{i} - 3\hat{j} + 7\hat{k}$ **(N) acts on a particle which undergoes a displacement** $\vec{r} = 7\hat{i} + 3\hat{j} - 2\hat{k}$ **(M). Calculate the work done by the force**

(1) 37 J **(2) –9 J**

(3) 49 J **(4) 14 J**

Q.8 **A pump ejects 12000 kg of water at speed of 4 m/s in 40 second. Find the average rate at which the pump is working**

(1) 0.24 KW **(2) 2.4 W** **(3) 2.4 KW** **(4) 24 W**

Q.9 **An object of mass m accelerates uniformly from rest to a speed v_f in time t_f. Then the instantaneous power delivered to the object, as a function of time t is -**

(1) $mt\left(\frac{V_f}{t_f}\right)^2$ **(2)** $mt\frac{V_f}{t_f}$

(3) $\frac{1}{2}mt^2\left(\frac{V_f}{t_f}\right)^2$ **(4)** $\frac{1}{2}mt^2\left(\frac{V_f}{t_f}\right)$

Q.10 **A self propelled vehicle of mass m whose engine delivers constant power P has an acceleration $a = \frac{P}{mv}$ (assume that there is no friction). In order to increase its velocity from v_1 to v_2, the distance it has to travel will be**

(1) $\frac{3P}{m}(v_2^2 - v_1^2)$ **(2)** $\frac{m}{3P}(v_2^3 - v_1^3)$ **(3)** $\frac{m}{3P}(v_2^2 - v_1^2)$ **(4)** $\frac{m}{3P}(v_2 - v_1)$

Q.11 **If a force F is applied on a body and it moves with a velocity v , the power will be-**

(1) F v **(2) F / v** **(3) F / v^2** **(4) F v^2**

Q.12 **A light and a heavy body have equal momentum. Which one has greater K.E.?**

(1) the light body **(2) both have equal K.E.**

(3) the heavy body **(4) data given is incomplete**

Q.13 **A 300 g mass has a velocity of (3i + 4j) m/s at a certain instant what is its K.E. ?**

(1) 1.35 J **(2) 2.4 J**

(3) 3.75 J **(4) 7.35 J**

Q.14 **Two bodies of mass 1 kg and 4 kg are moving with equal kinetic energies. The ratio of their linear momentum is-**

(1) 1 : 2 **(2) 2 : 1** **(3) 4 : 1** **(4) 1 : 4**

Q.15 **Two springs A and B($k_A = 2k_B$) are stretched by applying forces of equal magnitudes at the four ends. If the energy stored in A is E, that in B is**

(1) E/2 **(2) 2E** **(3) E** **(4) E/4**

Q.16 **The principle of conservation of energy implies that-**

(1) the total mechanical energy is conserved. **(2) the total kinetic energy is conserved**

(3) the total potential energy is conserved. **(4) sum of all types of energies is conserved.**

Q..17 **A force 'F' stops a body of mass 'm' moving with a velocity 'u' in a distance 's'. The force required to stop a body of double the mass moving with double the velocity in the same distance is-**

(1) 2F **(2) 4F** **(3) 6F** **(4) 8F**

Q.18 **A bomb at rest explodes into two parts of masses m_1 and m_2 . If the momentums of the two parts be p_1 and p_2, then their kinetic energies will be in the ratio of-**

(1) m_1 / m_2 **(2) m_2 / m_1** **(3) p_1 / p_2** **(4) p_2 / p_1**

Q.19 **A body of mass m collides against a wall with the velocity v and rebounds with the same speed. Its change of momentum is-**

(1) 2 mv **(2) mv** **(3) – mv** **(4) 0**

Q.20 **A bomb initially at rest explodes by it self into three equal mass fragments. The velocities of two fragments are ($3\hat{i} + 2\hat{j}$) m/s and ($-\hat{i} - 4\hat{j}$) m/s. The velocity of the third fragment is (in m/s)-**

(1) $2\hat{i} + 2\hat{j}$ **(2) $2\hat{i} - 2\hat{j}$** **(3) $-2\hat{i} + 2\hat{j}$** **(4) $-2\hat{i} - 2\hat{j}$**

Q.21 **A stone of mass m_1 moving with a uniform speed v suddenly explodes on its own into two fragments. If the fragment of mass m_2 is at rest, the speed of the other fragment is-**

(1) $\frac{m_1 v}{(m_1 + m_2)}$ **(2)** $\frac{m_2 v}{(m_1 - m_2)}$ **(3)** $\frac{m_1 v}{(m_1 + m_2)}$ **(4)** $\frac{m_1 v}{m_2}$

Q.22 **A monkey of mass 20kg rides on a 40kg trolley moving with constant speed of 8m/s along a horizontal track. If the monkey jumps vertically to grab the overhanging branch of a tree, the speed of the trolley after the monkey has jumped off is -**

(1) 8 m/s **(2) 1 m/s** **(3) 4 m/s** **(4) 12 m/s**

Q.23 **A nucleus of mass number A originally at rest emits a-particle with speed v. The recoil speed of daughter nucleus is :**

(1) $\frac{4v}{A-4}$ **(2)** $\frac{4v}{A+4}$ **(3)** $\frac{v}{A-4}$ **(4)** $\frac{v}{A+4}$

Q.24 **Two particles A and B which are initially at rest move towards each other under the mutual force of attraction. At the instant when the speed of A is v and the speed of B is 2v. The speed of the centre of mass of the system is -**

(1) v **(2) 1.5v** **(3) 3v** **(4) zero**

Q.25 **Which of the following force is conservation force -**

(1) Electrostatic **(2) Frictional** **(3) Viscous** **(4) Air resistance**

Q.26 **Which one of the following force is non-conservative ?**

(1) Gravitational force

(2) Electrostatic force

(3) Lorentz force

(4) Viscous force

Q.27 **A body is dropped from a certain height. When it lost an amount of P.E. 'U', it acquires a velocity ' v '. The mass of the body is-**

(1) $\frac{2U}{v^2}$ **(2)** $\frac{2v}{U^2}$ **(3)** $\frac{2v}{U}$ **(4)** $\frac{U^2}{2v}$

Q.28 **A block of mass m slides down along the surface of the bowl (radius R) from the rim to the bottom. The velocity of the block at the bottom will be-**

(1) $\sqrt{(\pi Rg)}$ **(2)** $2\sqrt{(\pi Rg)}$ **(3)** $\sqrt{(2Rg)}$ **(4)** $\sqrt{(gR)}$

Q.29 A sphere is suspended by a thread of length l. What minimum horizontal velocity is to be imparted to the sphere for it to reach the height of suspension ?

(1) $\sqrt{gl}$ **(2)** gl **(3)** $\sqrt{2gl}$ **(4)** $\sqrt{l/g}$

Q.30 A body of mass m kg is rotating in a vertical circle at the end of a string of length r metre. The difference in the K.E. at the top and bottom of the circle is-

(1) mgr **(2) 2mgr**

(3) $\frac{mg}{r}$ **(4)** $\frac{2mg}{r}$

ANSWER KEY

Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ans.	3	3	2	3	4	1	2	3	1	2
Que.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.	1	1	3	1	2	4	4	2	1	3
Que.	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Ans.	1	1	1	4	1	4	1	3	3	2