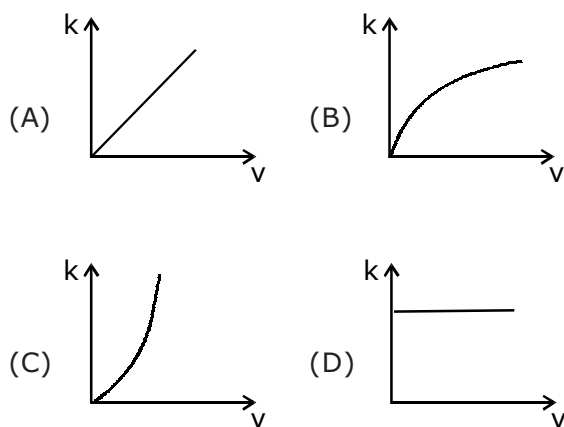


Dear student following is an Easy level [O ● O O O] test paper. Score of 18 Marks in 15 Minutes would be a satisfactory performance. Questions 1-9 (+3, -1). (All Questions have Single Options correct)

Q.1 The graph of kinetic energy (K) of a body versus velocity (v) is represented as :



Q.2 A uniform force of 4N acts on body of mass 8 kg for a distance of 2.0 m. The K.E. acquired by the body is :
 (A) 8J (B) 64J (C) 8gJ (D) 16gJ

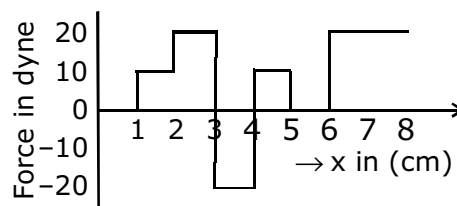
Q.3 A constant force F is applied on a body. How does the power generated by force depend upon time elapsed (t) : P is proportional
 (A) t (B) $t^{3/2}$ (C) $t^{1/2}$ (D) t^2

Q.4 A particle of mass m strikes a wall normally with velocity \bar{v} and then its velocity is reversed. The change in momentum is :
 (A) $m\bar{v}$ (B) $2m\bar{v}$ (C) $-2m\bar{v}$ (D) zero

Q.5 The explosion of a bomb :
 (A) is not a collision at all
 (B) is an elastic collision
 (C) is an inelastic collision
 (D) may be elastic or inelastic collision

Q.6 The slope of potential energy versus position graph represents
 (A) force (B) work
 (C) power (D) momentum

Q.7 The relationship between force and position is shown in fig. (in one dimensional case). The work done by the force in displacing a body from $x = 1$ cm to $x = 5$ cm is :



(A) 20 erg (B) 60 erg
 (C) 70 erg (D) 700 erg

Q.8 Work done by a simple pendulum in a complete vibrations is
 (A) zero (B) $mg\ell(1 - \cos\theta)$
 (C) $2\pi\sqrt{\frac{\ell}{g}}$ (D) $\pi\sqrt{\frac{\ell}{g}}$

Q.9 A ball of mass m moving with a constant velocity strikes against a ball of same mass at rest. If e = coefficient of restitution, then what will be the ratio of velocity of two balls after collision ?

(A) $\frac{1-e}{1+e}$ (B) $\frac{e-1}{e+1}$
 (C) $\frac{1+e}{1-e}$ (D) $\frac{2+e}{e-1}$



PHYSICS IIT JEE (JULY 3rd WEEK CLASS TEST 5) (WORK, POWER, ENERGY & COLLISION) ANSWER KEY

Name : Roll No. :

	A	B	C	D		A	B	C	D		A	B	C	D
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9
Ans.	C	A	A	C	C	A	A	A	A

SOLUTIONS

Sol.1 (C)

Sol.2 (A)

$$\begin{aligned} \text{Gain in K.E.} &= \text{Work done by force} \\ &= Fs = 4 \times 2 = 8 \text{ J} \end{aligned}$$

Sol.3 (A)

$$a = \frac{dv}{dt} = \frac{F}{m}$$

$$\Rightarrow v = \frac{F}{m} t$$

$$\therefore P = Fv = F \left(\frac{F}{m} t \right) = \frac{F^2}{m} t$$

$$\Rightarrow P \propto t$$

Sol.4 (C)

Sol.5 (C)

Sol.6 (A)

$$\text{This comes from } F = - \frac{dV}{dr}.$$

Sol.7 (A)

$$\begin{aligned} W_{1-5} &= W_1 + W_2 + W_3 + W_4 + W_5 \\ &= 10(1) + 20(1) - 20(1) + 10(1) \\ &= 20 \text{ erg} \end{aligned}$$

Sol.8 (A)

In a complete vibration, final position coincides with the initial position. Therefore, $W = 0$.

Sol.9 (A)

As $u_2 = 0$ and $m_{12} = m_2$, therefore, from $m_1 u_1 + m_2 u_2 = m_1 v_1 + m_2 v_2$, we get

$$u_1 = v_1 + v_2$$

$$\text{Also, } e = \frac{v_2 - v_1}{u_1} = \frac{v_2 - v_1}{v_2 + v_1} = \frac{1 - v_1/v_2}{1 + v_1/v_2},$$

$$\text{which gives } \frac{v_1}{v_2} = \frac{1 - e}{1 + e}.$$