Physics

1. If work, force and time are represented by A, B and C respectively then the term $\left(\frac{A}{BC}\right)$ will present

(1) Displacement (2) Velocity (3) Acceleration (4) Momentum

Ans. (2)

Sol. Work = A $\Rightarrow$ Force = B $\Rightarrow$ Time = C

Then the term

$\left(\frac{A}{BC}\right)=\left(\frac{\text{work}}{\text{force}\times\text{time}}\right)$ $\therefore$ Work = force × displacement

$\frac{A}{BC}=\frac{\text{force}\times\text{displacement}}{\text{force}\times\text{time}}=\frac{\text{displacement}}{\text{time}}=\text{velocity}$

2. The initial velocity of a particle is 10 m/s. It is moving with an acceleration of 4 m/s^2. The distance covered by the particle after 2s is :

(1) 6 m (2) 18 m (3) 22 m (4) 28 m

Ans. (4)

Sol. Initial velocity u = 10 m/s $\Rightarrow$ time (t) = 2 sec

acceleration a = 4 m/s $\Rightarrow$ distance S = ?

$S = ut + \frac{1}{2}at^2$ $= (10\times0+\frac{1}{2}\times4\times(2)^2)\text{ m} = 28\text{m}$

3. Unit of universal gravitational constant is :

(1) N-m^2/kg (2) N-m^2/kg^2 (3) N-m^2/m^2 (4) N-m/kg^2

Ans. (2)

Sol. $F=\frac{GM_1M_2}{r^2}$

$G=\frac{F.r^2}{M_1M_2}$

Putting the unit of all quantities

$G=\frac{N-m^2}{kg^2}$

4. If the speed of wave is 350 m/s and its wavelength is 100 cm then the frequency of the wave will be :

(1) 35 Hz (2) 350 Hz (3) 700 Hz (4) 3500 Hz

Ans. (2)

Sol. Wave velocity (v) = frequency (η) × wavelength (λ)

$V = \eta\lambda$

350 m/s = $\eta\times$lm

η = 350 Hz

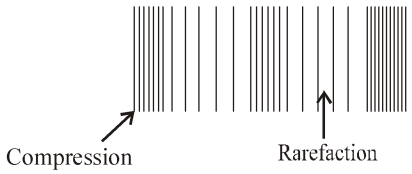
5. The wave having compression and rarefaction is known as :

(1) Transverse wave (2) Longitudinal wave

(3) Light wave (4) Ultraviolet wave

Ans. (2)

Sol. Wave having compression and rarefaction is known as longitudinal



6. If the distance between two masses is doubled then the gravitational force between them will be :

(1) one - fourth (2) half (3) double (4) four times

Ans. (1)

Sol. $F \propto \frac{1}{r^2}$ (masses = constant)

If new distance become r' $\rightarrow$ 2r
then new force F'

$$F' \propto \frac{1}{(r')^2}$$

$$F' \propto \frac{1}{(2r)^2}$$

$$F' \propto \frac{1}{4r^2}$$

$$F' = \frac{F}{4}$$

7. Focal length of a lens is 25 cm. In dioptre power of lens will be :

(1) 0.04 (2) 0.4 (3) 4 (4) 2.5

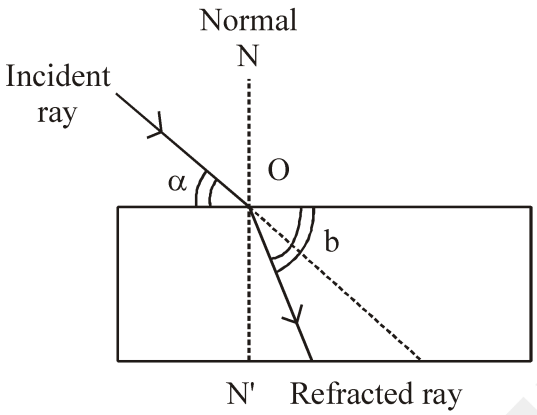
Ans. (3)

Sol. f = 25 cm

f = 0.25 m

$$P = \frac{1}{f(m)} = \frac{1}{0.25} = 4 \text{ Dioptere}$$

8. In the given ray diagram correct relation for Snell's law is :



(1) $\frac{\sin a}{\sin b} = \text{constant}$ (2) $\frac{\sin b}{\sin a} = \text{constant}$

(3) $\frac{\sin(90-a)}{\sin(90-b)} = \text{constant}$ (4) $\frac{\sin(90-a)}{\sin b} = \text{constant}$

Ans. (3)

Sol. Angle of incidence

$\angle i = 90 - a$

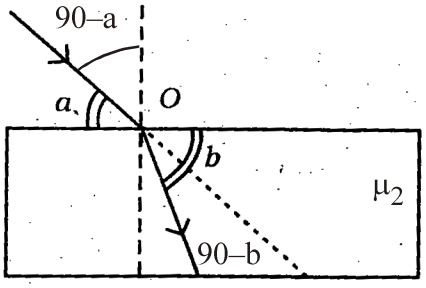
angle of refraction

$\angle r = 90 - b$

$\mu_1 \sin i = \mu_2 \sin r$

$\mu_1 \sin(90-a) = \mu_2 \times \sin(90-b)$

$\frac{\sin(90-a)}{\sin(90-b)} = \frac{\mu_2}{\mu_1} = \text{constant}$



9. Which term does not represent electric power ?

(1) $P = \frac{V}{I}$ (2) $P = VI$ (3) $P = I^2R$ (4) $P = \frac{V^2}{R}$

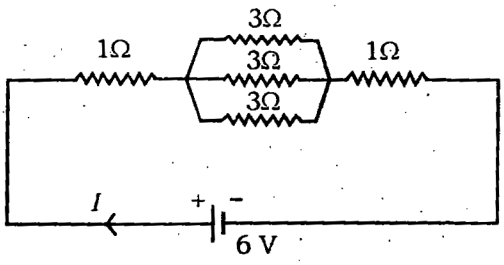
Ans. (1)

Sol. $P = V \times I$

$P = I^2 R$

$P = \frac{V^2}{R}$

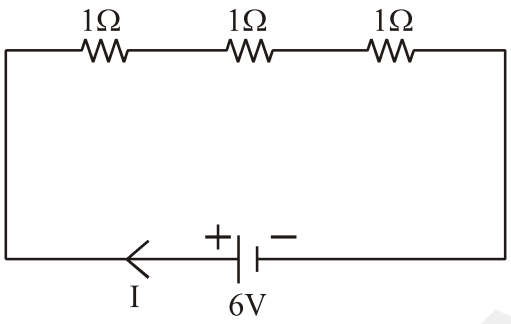
10. In the given circuit the value of current I will be

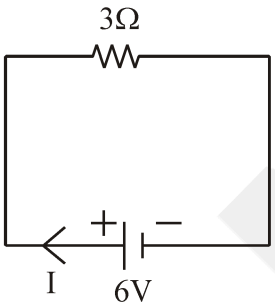


(1) $\frac{6}{11}$A (2) $\frac{6}{5}$A (3) 2A (4) 1A

Ans. (3)

Sol.





$R_{eq} = 3\Omega$

$V = 6V$

$V = IR_{eq}$

$6V = I \times 3\Omega$

$I = 2A$

11. Unit of magnetic flux is :

(1) volt (2) weber (3) hertz (4) ohm-metre

Ans. (2)

Sol. SI unit of magnetic flux is weber

12. Spring constant of a spring is $K = 6\times10^3$ N/m. Work done to stretch it 10^{-2} m from mean position is :

(1) 0.003 J (2) 0.03 J (3) 0.3 J (4) 3 J

Ans. (3)

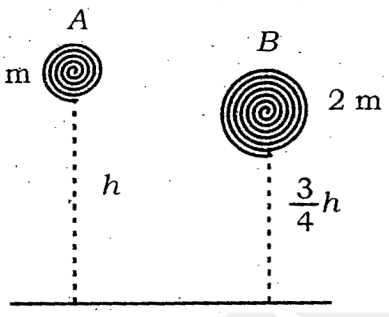
Sol. $K = 6\times10^3$ N/m

$x = 10^{-2}$

$$W.D. = \frac{1}{2}Kx^2$$

$$= \frac{1}{2}\times\left(6\times10^3\right)\times\left(10^{-2}\right)^2 = \frac{1}{2}\times6\times10^3\times10^{-4} = 0.3 \text{ J}$$

13. Ratio of potential energies of body A and body B will be :



(1) $\frac{U_A}{U_B} = \frac{2}{3}$ (2) $\frac{U_A}{U_B} = \frac{3}{2}$ (3) $\frac{U_A}{U_B} = \frac{1}{3}$ (4) $\frac{U_A}{U_B} = \frac{3}{4}$

Ans. (1)

Sol. $PE_A = mgh$

$$PE_B = (2m)\ g\left(\frac{3}{4}h\right)$$

$$\frac{PE_A}{PE_B} = \frac{mgh}{(2m)(g)\left(\frac{3}{4}h\right)}$$

$$\frac{PE_A}{PE_B} = \frac{2}{3}$$