

Physics

These are 27 questions out of 40. Remaining questions will be updated soon.

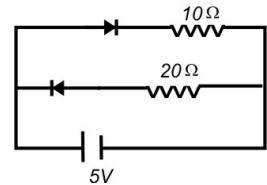
1. $I = 0.1(e^{V/V_T} - 1)$, where $V = 0.5$ V, $V_T = 0.025$ V then what is the value of resistance?

- (1) 25 Ω (2) 50 Ω (3) 10 Ω (4) Zero

Ans: [4]

2. Current supplied by battery in following circuit is

- (1) 2 A (2) 3/4 A
(3) 1/2 A (4) 1/6 A



Ans: [3]

3. What is the resultant frequency of single string, given that when it is cut into three pieces, pieces have frequency n_1, n_2 & n_3 respectively.

- (1) $n = n_1 + n_2 + n_3$ (2) $\frac{1}{n} = \frac{1}{n_1} + \frac{1}{n_2} + \frac{1}{n_3}$
(3) $n = \sqrt{n_1} + \sqrt{n_2} + \sqrt{n_3}$ (4) None

Ans: [2]

4. Two SHM waes of same amplitude & frequency are forced to travel among 'X' & 'Y' coordinate axis, (having phase diff. $\frac{\pi}{2}$) when superimposed, give rise to

- (1) parabola (2) ellipse (3) circle (4) hyperbola

Ans: [3]

5. In a SHM, $k = 400$, total energy = 2 J, Mass = 1 Kg, then maximum acceleration during the SHM is

- (1) 400 (2) 40 (3) 4 (4) 2

Ans: [2]

6. If area = 10^{-2} , surface tension = 10, then final surface energy

- (1) 2×10^{-1} (2) 2×10^{-2} (3) 2×10^{-3} (4) 1×10^{-2}

Ans: [1]

7. Change in pressure required to change density by 0.1%. Given that bulk modulus = 2×10^9
- (1) 2×10^6 (2) 2×10^7 (3) 2×10^8 (4) 2×10^{11}

Ans: [1]

8. A radioactive element decay by two process simultaneously one having half life ' t_1 ' & other having half life ' t_2 '

(1) $t = t_1 + t_2$ (2) $t = \frac{t_1 t_2}{t_1 + t_2}$ (3) $t = \frac{t_1 t_2}{2(t_1 + t_2)}$ (4) $t = \frac{t_1 + t_2}{2}$

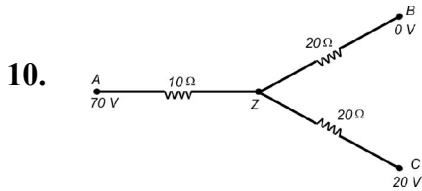
Ans: [2]

9. Time period of simple pendulum on earth's surface is ' t_1 ' and when it is taken upto height equal 'R'

(R = radius of earth). The time period is ' t_2 ', final $\frac{t_2}{t_1}$

(1) 1 (2) 2 (3) 3 (4) 4

Ans: [2]



In given figure 'Z' is at potential.

(1) 40 V (2) 30 V (3) 60 V (4) 70 V

Ans: [1]

11. If light travels 10 cm in transparent medium in $t = 4.5 \times 10^{-10}$ seconds. What is the optical length travelled by it

(1) 11.75 cm (2) 13.5 cm (3) 14 cm (4) 10 cm

Ans: [2]

12. Two different rods of same material having length L_1 & L_2 and diameters d_1 & d_2 respectively are supplied with same temperature difference. The rate of transfer of heat through conduction is same through both, when

(1) $\frac{L_1}{L_2} = \frac{d_2}{d_1}$ (2) $\frac{L_1}{L_2} = \frac{d_1}{d_2}$ (3) $\frac{L_1}{L_2} = \left(\frac{d_1}{d_2}\right)^2$ (4) $\frac{L_1}{L_2} = \left(\frac{d_2}{d_1}\right)^2$

Ans: [3]

13. In a rod of length 3 cm, linear mass density varies as $\lambda = 2 + x$. Location of its centre of gravity is

- (1) $\frac{12}{7}$ (2) $\frac{8}{7}$ (3) $\frac{10}{7}$ (4) $\frac{7}{12}$

Ans: [1]

14. Flux through a body varies with time as, $\phi = 3t^2 - 5t + 3$ & body has resistance 20Ω . Find the induced current at $t = 0.5$ s

- (1) 0.1 A (2) 0.2 A (3) 0.5 A (4) 0.3 A

Ans: [1]

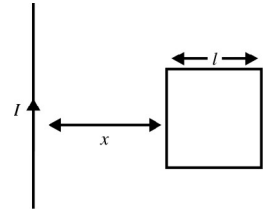
15. A force $F = 1$ kN is applied on a body. Body is displaced by $x = 1$ mm. Then one work done is

- (1) 1 erg (2) 1 joule (3) 0.5 erg (4) 0.5 Joule

Ans: [2]

16. Find inductance due to current carrying wire in loop.

- (1) $\frac{\mu_0 x}{2\pi} \log\left(\frac{\ell}{x} + 1\right)$ (2) $\frac{\mu_0 x}{2\pi} \log\left(\frac{\ell}{x} - 1\right)$ (3) $\frac{\mu_0 \ell}{2\pi} \log\left(\frac{\ell}{x} + 1\right)$ (4) zero



Ans: [3]

17. $\vec{r} = \hat{i} + \hat{j}$, $\vec{v} = \hat{i} + \hat{j}$, mass = 1 kg. Then angular

- (1) is along y axis (2) is along x axis (3) is along Z axis (4) Zero

Ans: [4]

18. $\vec{x}_1 = \hat{i} + \hat{j} + \hat{k}$, $\vec{x}_2 = -\hat{i} + \hat{j} - \hat{k}$

$m_1 = 2$ kg $m_2 = 3$ kg

Find position vector of centre of mass.

- (1) $\frac{-\hat{i} + 5\hat{j} - \hat{k}}{5}$ (2) 0 (3) 0 (4) 0

Ans: [1]

19. A coin of mass 10 kg rolls on a plane with velocity 6 m/s. Find its total kinetic energy.

- (1) 9 J (2) 18 J (3) 27 J (4) 36 J

Ans: [3]

20. If angular momentum of an electron revolving in an orbit is 'J'. What is its magnetic moment.

- (1) $\frac{2eJ}{M_e}$ (2) $\frac{eJ}{2M_e}$ (3) $\frac{2e}{M_e J}$ (4) $\frac{2J}{eM_e}$

Ans: [2]

21. Find equivalent capacitance,

- (1) $\frac{\epsilon_0 A}{d}$ (2) $\frac{\epsilon_0 A}{2d}$ (3) $2 \frac{\epsilon_0 A}{d}$ (4) zero



Ans: [3]

22. A spring of spring constant 'K' performing SHM (dipped in water) has a restoring force $R\psi'$. Then which of the following is true

- (1) $M\psi'' = R\psi' - K\psi'$ (2) $M\psi'' = -R\psi' + K\psi'$
(3) $M\psi'' = -R\psi' - K\psi'$ (4) $M\psi'' = R\psi' + K\psi'$

Ans: [3]

23. In fresnal biprism experiment, if r_1, r_2, r_3 represent the ratio of radius of 1st, 2nd, & 3rd HPZ then

- $r_1 : r_2 : r_3 =$
(1) 1 : 2 : 3 (2) 1 : $\sqrt{2}$: $\sqrt{3}$ (3) 1 : 4 : 9 (4) 1 : 3 : 5

Ans: [2]

24. 10 Ω heater is connected to 220 V, 50 Hz. The value of potential difference across heater is

- (1) $220\sqrt{2}$ V (2) 220 V (3) $200\sqrt{2}$ V (4) 110 V

Ans: [1]

25. A unit mass at position vector $\vec{r} = (3\hat{i} + 4\hat{j})$ is moving with velocity $\vec{v} = (5\hat{i} - 6\hat{j})$. Find angular momentum of body about origin is

- (1) 28 units along z-axis (2) 38 units along x-axis
(3) 38 units along y-axis (4) 38 units along z-axis

Ans: [4]

26. A uniform flexible chain of length 1 m is placed a smooth horizontal table with one-fifth of its length hanging over the edge. Find the velocity of the chain at instant it completely slips

- (1) $\frac{\sqrt{24g}}{5}$ (2) $\frac{\sqrt{g}}{5}$ (3) $5\sqrt{g}$ (4) none of these

Ans: [1]

27. An α -particle moves in a circular path of radius 0.83 cm in the presence of magnetic field of 0.25 Wb/m². The de Broglie wave length of particle is

- (1) 1 Å (2) 0.1 Å (3) 0.01 Å (4) 0.001 Å

Ans: [3]