

05/04/2026

Morning



Aakash

Medical | IIT-JEE | Foundations

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Memory Based Answers & Solutions

Time : 3 hrs.

for

M.M. : 300

JEE (Main)-2026 (Online) Phase-2

(Physics, Chemistry and Mathematics)

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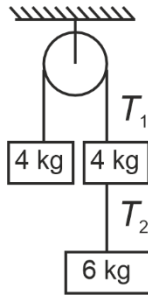
PHYSICS

SECTION - A

Multiple Choice Questions: This section contains 20 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4), out of which **ONLY ONE** is correct.

Choose the correct answer:

1. As shown in figure, the ratio of T_1 and T_2 is



- (1) 5/3
- (2) 4/3
- (3) 10/3
- (4) 6/3

Answer (1)

Sol. $a = \frac{(10g - 4g)}{14} = \frac{6g}{14} = \frac{3g}{7}$

$6g - T_2 = 6 \times \frac{3g}{7}$

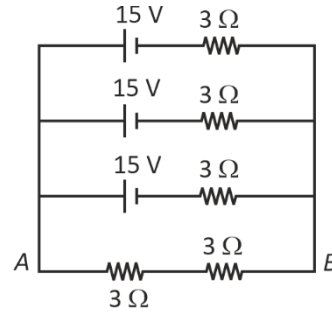
$\Rightarrow T_2 = 6g - 3 \times \frac{6g}{7} = 6g \times \frac{4}{7}$

And $T_1 - 4g = 4 \times \frac{3g}{7}$

$T_1 = 4g \left(1 + \frac{3}{7}\right) = 4g \times \frac{10}{7}$

$\frac{T_1}{T_2} = \frac{5}{3}$

2. For the circuit shown below, find current across AB (I_{AB})



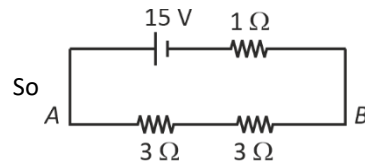
- (1) $\frac{10}{7}$ A
- (2) $\frac{13}{7}$ A
- (3) $\frac{11}{7}$ A
- (4) $\frac{15}{7}$ A

Answer (4)

Sol. $\frac{1}{r_0} = \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1$

$\Rightarrow r_0 = 1 \Omega$

$\epsilon_0 = \frac{\epsilon(r^2) \times 3}{3r^2} = \epsilon = 15 \text{ V}$



So $I_{AB} = \frac{15}{7}$

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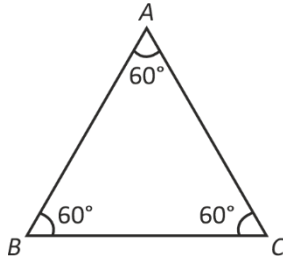
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3. Speed of light in the prism = 2×10^8 m/s. Then find minimum deviation through the prism.



- (1) $2\sin^{-1}\left(\frac{3}{4}\right) - 30^\circ$ (2) $2\sin^{-1}\left(\frac{3}{4}\right) + 30^\circ$
 (3) $2\sin^{-1}\left(\frac{3}{4}\right) + 60^\circ$ (4) $2\sin^{-1}\left(\frac{3}{4}\right) - 60^\circ$

Answer (4)

Sol. $\mu = \frac{\sin\left(\frac{\delta_m + A}{2}\right)}{\sin\left(\frac{A}{2}\right)}$

$A = 60^\circ, u = \frac{3 \times 10^8}{2 \times 10^8} = \frac{3}{2}$

$\frac{3}{2} = \frac{\sin\left(\frac{\delta_m + 60^\circ}{2}\right)}{\sin\left(\frac{60^\circ}{2}\right)}$

$\delta = 2\sin^{-1}\left(\frac{3}{4}\right) - 60^\circ$

4. Select the quantity with matching dimensions of $ML^2 T^{-4} A^{-2}$.

- (1) $\frac{R}{\sqrt{LC}}$ (2) $\frac{1}{R} \sqrt{\frac{L}{C}}$
 (3) $\frac{R}{LC}$ (4) $\frac{C}{\sqrt{LR}}$

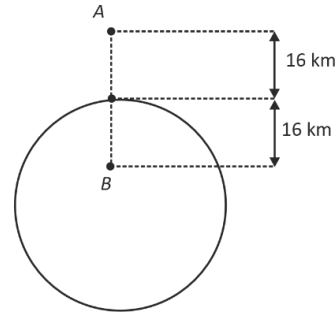
Answer (1)

Sol. $R = \frac{V}{i} = \frac{ML^2 T^{-2}}{A^2 T} = ML^2 T^{-3} A^{-2}, \sqrt{LC} = T$

$R_{req. \text{ dimension}} = \frac{R}{\text{time}} \Rightarrow \text{option-1}$

5. Two points A and B are 16 km from surface of earth.

Acceleration due to gravity at A & B is g_A & g_B , then $\frac{g_A}{g_B} =$



- (1) $\frac{1}{2}$ (2) $\frac{149}{200}$
 (3) $\frac{398}{399}$ (4) $\frac{441}{442}$

Answer (3)

Sol. Ratio = $\frac{g_0 \left(1 - \frac{2 \times 16}{6400}\right)}{g_0 \left(1 - \frac{16}{6400}\right)} = \frac{6400 - 32}{6400 - 16} = \frac{400 - 2}{400 - 1} = \frac{398}{399}$

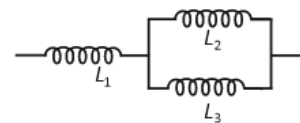
6. Young's modulus of wire is Y. Keeping material same, if radius of wire is doubled while length is halved. Then new value of Young's modulus is

- (1) 2Y (2) 4Y
 (3) Y (4) $\frac{Y}{2}$

Answer (3)

Sol. Young's modulus depends on material.

7. In circuit given below, $L_1 = L_2 = L_3$ & total energy stored in system is E_1 & energy stored in L_2 is E_2 . Then find $\frac{E_1}{E_2}$



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

Answer (1)

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Sol. Energy in L_3 will also be E_2

& in L_1 it will be $4E_2$

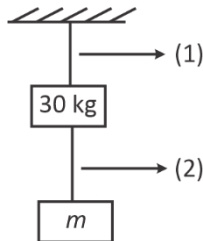
$$\therefore 2E_2 + 4E_2 = E_1$$

$$\Rightarrow 6E_2 = E_1$$

$$\therefore \frac{E_1}{E_2} = 6$$

8. Breaking stress of both wires is $1.2 \times 10^8 \text{ N/m}^2$ area of cross section of both wire is 0.008 cm^2 .

Find maximum value of m such that no wire breaks. ($g = 10 \text{ m/s}^2$)



(1) 4.1 kg

(2) 6.6 kg

(3) 8.7 kg

(4) 9 kg

Answer (2)

Sol. Wire 1 would tend to break first

$$\therefore \frac{30 + mg}{A} = 1.2 \times 10^8$$

$$\Rightarrow 30 + 10m = 1.2 \times 10^8 \times 0.008 \times 10^{-4}$$

$$\Rightarrow 10m = 1.2 \times 10 \times 8 - 30$$

$$m = 6.6 \text{ kg}$$

9. In a region where electric field exist as $-E_0 \hat{i}$ (V/m). Initial (at $t = 0$) velocity of particle of mass m is $4V_0 \hat{i}$.

$$\lambda_0 = \frac{h}{4mv_0} \text{ at instant } t = 0, \text{ then find } \lambda \text{ in terms of } \lambda_0 \text{ at}$$

time instant t .

$$(1) \lambda = \frac{h\lambda_0}{h + qE_0\lambda_0 t}$$

$$(2) \lambda = \frac{h\lambda_0}{h - qE_0\lambda_0 t}$$

$$(3) \lambda = \frac{h\lambda_0}{(h + 2E_0q\lambda_0 t)}$$

$$(4) \lambda = \frac{h\lambda_0}{\left(h + \frac{qE_0\lambda_0 t}{2}\right)}$$

Answer (2)

$$\text{Sol. } \lambda = \frac{h}{p}$$

at $t = 0$

$$P = 4mV_0.$$

$$\text{So } \lambda_0 = \frac{h}{4mV_0}$$

At t

$$V = 4V_0 - \left(\frac{qE_0}{m}\right)t$$

$$P = 4mV_0 - \frac{qE_0}{t}$$

$$\lambda = \frac{h}{4mV_0 - qE_0 t} = \frac{h}{\left(\frac{h}{\lambda_0} - qE_0 t\right)}$$

$$\Rightarrow \lambda = \frac{h\lambda_0}{h - qE_0\lambda_0 t}$$

10. In thermodynamics, with usual symbols two expressions are given

$$\text{Expression 1: } \Delta U = \mu C_v \Delta T + \frac{\mu R \Delta T}{\gamma - 1}$$

$$\text{Expression 2: } \gamma f = f + 2$$

Then

(1) E1 is correct and E2 is incorrect

(2) E1 is incorrect and E2 is correct

(3) E1, E2 are correct

(4) E1, E2 are incorrect

Answer (2)

Sol. Theoretical.

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11. Moment of inertia of rod about an axis passing through point at distance $\frac{l}{4}$ from center and perpendicular to rod is (The uniform rod is of mass m and length l)

- (1) $\frac{8}{63} ml^2$
- (2) $\frac{3}{7} ml^2$
- (3) $\frac{7}{44} ml^2$
- (4) $\frac{7}{48} ml^2$

Answer (4)

Sol. $I = \frac{ml^2}{12} + m\left(\frac{l}{4}\right)^2 = \left(\frac{1}{12} + \frac{1}{16}\right)ml^2 = \frac{7}{48} ml^2$

12. For a wave, equation is given as $y = 3 \sin(\omega t - 0.018x + \pi/4)$. Find the minimum distance between consecutive crest.

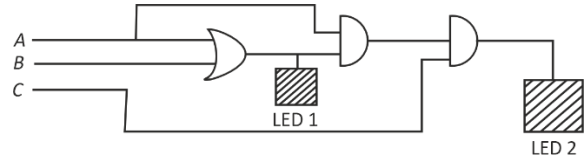
- (1) $\frac{200}{3} \pi$ (m)
- (2) $\frac{400}{3} \pi$ (m)
- (3) $\frac{1000}{9} \pi$ (m)
- (4) $\frac{500}{9} \pi$ (m)

Answer (3)

Sol. Distance between two consecutive crest is λ .

So, $\lambda = \frac{2\pi}{k} = \frac{2\pi}{0.018}$
 $\Rightarrow \lambda = \frac{1000\pi}{9} \text{ m.}$

13. Both LED's will switch on in which of the following option:



- (1)

A	B	C
1	1	0
- (2)

A	B	C
1	0	0
- (3)

A	B	C
1	0	1
- (4)

A	B	C
0	1	1

Answer (3)

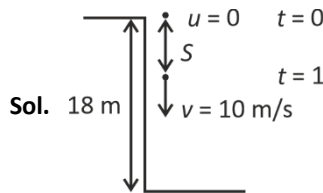
Sol. For $A = 1$ $B = 0$ and $C = 1$

Both LEDs will switch on

14. A ball is dropped from 18 m high tower. Find distance of ball from ground when the speed of ball becomes equal to magnitude of acceleration of ball ($g = 10 \text{ m/s}^2$)

- (1) 8
- (2) 18
- (3) 13
- (4) 10

Answer (3)



Sol. 18 m
 $S = \frac{1}{2} \times 10 \times 1^2 = 5$

\therefore Distance from ground will be 13 m.

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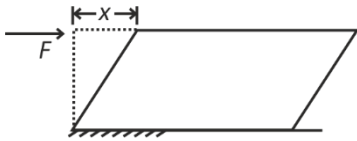
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15. On the top surface of a cube (length = 5 cm) force F is acting tangentially. Lower surface is fixed, then find shifting x .

[Modulus of rigidity $\eta = 10^5$ (SI unit)]



(1) $x = \frac{F}{2500}$

(2) $x = \frac{F}{5000}$

(3) $x = \frac{F}{4000}$

(4) $x = \frac{F}{8000}$

Answer (2)

Sol. $\frac{F \cdot h}{A \cdot x} = \eta$

$$\Rightarrow x = \frac{F \times 5 \times 10^{-2}}{25 \times 10^{-4} \times 10^5}$$

$$\Rightarrow x = \frac{F}{5000}$$

16. 10 VSD matches with 9 MSD in a vernier calliper. 1 MSD is of 1 mm. When no reading is taken, the zero of vernier scale is just right of zero of main scale and 7th VSD matches with one MSD then zero error is

- (1) 0.7 cm, +ve (2) 0.7 cm, -ve
(3) 0.7 mm, -ve (4) 0.7 mm, +ve

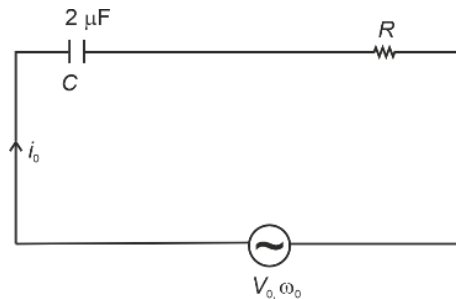
Answer (4)

Sol. $LC = 0.1 \text{ mm}$

Error = 0.7 mm

17. In circuit given below, current in circuit is i_0 . If angular frequency is changed from ω_0 to $\frac{\omega_0}{8}$ the current becomes

$\frac{i_0}{4}$. Find $\frac{1}{\omega_0 CR}$



(1) $\sqrt{\frac{5}{16}}$

(2) $\sqrt{\frac{42}{13}}$

(3) $\sqrt{\frac{51}{38}}$

(4) $\sqrt{\frac{3}{2}}$

Answer (1)

Sol. $i_0 = \frac{V_0}{\sqrt{R^2 + X_L^2}}$

And $\frac{i_0}{4} = \frac{V_0}{\sqrt{R^2 + X_C^2 64}}$

$$\Rightarrow 4 = \frac{\sqrt{R^2 + X_L^2 64}}{\sqrt{R^2 + X_C^2}}$$

18. In hydrogen atom an electron is revolving in 4th Bohr's orbit. Find wavelength of the incident radiation to excite this electron to 16th Bohr's orbit. [Use $hc = 1240 \text{ nm} \cdot \text{ev}$.]

- (1) 1556 nm. (2) 400 nm.
(3) 800 nm. (4) 2000 nm.

Answer (1)

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Sol. $\Delta E = E_0 \left[\frac{1}{16} - \frac{1}{256} \right] = \frac{hc}{\lambda}$
 $\Rightarrow E_0 \left(\frac{15}{256} \right) = \frac{hc}{\lambda}$
 $\Rightarrow \lambda = \frac{1240 \times 256}{13.6 \times 15} = 1556 \text{ nm}$

19.
20.

SECTION - B

Numerical Value Type Questions: This section contains 5 Numerical based questions. The answer to each question should be rounded-off to the nearest integer.

21. In a YDSE setup in air, fringe width is $2.4 \mu\text{m}$. If we submerge the setup in a liquid of refractive index 1.2 then find the new fringe width (in μm).

Answer (2)

Sol. $\Delta w = \frac{\lambda D}{d}$

But in case of medium with $m = 1.2$

$\Delta w' = \frac{\lambda D}{1.2 d}$

So $\frac{\Delta w'}{\Delta w} = \frac{\lambda D d}{1.2 d \times \lambda D} = \frac{1}{1.2}$

$\Rightarrow \Delta w' = \left(\frac{2.4}{1.2} \right) \mu\text{m} = 2 \mu\text{m}$

22. A particle moving uniformly enters a region having uniform magnetic field $(3\hat{i} + 2\hat{j})T$. Its acceleration is $\left(4\hat{i} - \frac{x}{2}\hat{j} \right) \text{ m/s}^2$. Find the value of x .

Answer (12)

Sol. As the acceleration and magnetic field are in x - y plane so velocity must be in z direction

So $\frac{q(v\hat{k}) \times (3\hat{i} + 2\hat{j})}{m} = \left(4\hat{i} - \frac{x}{2}\hat{j} \right)$

$\Rightarrow \frac{qv}{m} (3\hat{j} - 2\hat{i}) = 4\hat{i} - \frac{x}{2}\hat{j}$

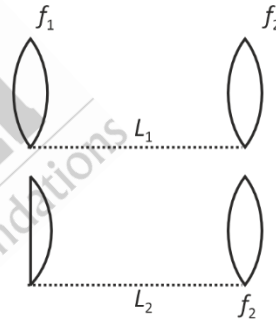
Clearly $\frac{qv}{m} = -2$

So acceleration will be

$(4\hat{i} - 6\hat{j}) = \left(4\hat{i} - \frac{x}{2}\hat{j} \right)$

Clearly $x = 12$

23. Two microscopes gives same magnification in which objective lens are same and eyepiece of 2 is exactly half of eyepiece 1 which is equiconvex. Then $\frac{L_2}{L_1}$ is



Answer (2)

Sol. $M = \frac{DL}{f_0 f_e} \Rightarrow \frac{L_1}{f_1} = \frac{L_2}{f_1'}; \frac{1}{f} = (\mu - 1) \left(\frac{1}{R_1} + \frac{1}{R_2} \right)$

$\frac{1}{f_1} = \frac{2(\mu - 1)}{R}$

$\frac{L_2}{L_1} = 2; \frac{1}{f_1'} = \frac{2(\mu - 1)}{R} \Rightarrow 2f_1 = f_1'$

24.
25.

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