06/04/2026

Evening

Aakash

Medical | IIT-JEE | Foundations

Corporate Office : AESL, 3rd Floor, Incuspaze Campus-2, Plot-13, Sector-18, Udyog Vihar, Gurugram, Haryana-122015

Memory Based
Answers & Solutions

for

Time : 3 hrs. M.M. : 300

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

(Physics, Chemistry and Mathematics)

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. Minimum deviation for an equilateral prism is 30°, refractive index is

(1) $\sqrt{2}$

(2) $\sqrt{3/2}$

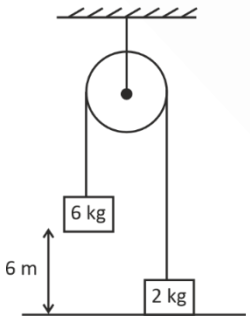
(3) 2

(4) 4

Answer (1)

Sol. $\mu = \dfrac{\sin\left(\dfrac{60+30}{2}\right)}{\sin\dfrac{60}{2}} = \dfrac{1/\sqrt{2}}{1/2} = \sqrt{2}$

2. If system given below is released from rest then find speed of 6 kg block just before hitting ground: (g = 10 m/s^2)



(1) 6.20 m/s (2) 7.74 m/s

(3) 4.70 m/s (4) 5.20 m/s

Answer (2)

Sol. $a = \dfrac{60-20}{8}$

$\Rightarrow a = 5$ m/s^2

And $v^2 = 2 \times 5 \times 6$

$v = \sqrt{60}$

$\Rightarrow v = 7.74$ m/s

3. Find electric field, for given electrostatic potential field, at point $p(2, 3)$; $v = 5(x^2 - y^2)$.

(1) $-20\hat{i} + 30\hat{j}$

(2) $20\hat{i} + 30\hat{j}$

(3) $30\hat{i} - 20\hat{j}$

(4) $30\hat{i} + 20\hat{j}$

Answer (1)

Sol. $\vec{E} = -5(2x)\hat{i} + 5(2y)\hat{j}$

$= 10\left(-2\hat{i} + 3\hat{j}\right)$

4. $H_1^2 + H_1^2 \longrightarrow He_1^4$

Binding energy per nucleon of H_1^2 and H_2^4 are 1.1 MeV and 7 MeV respectively. Find energy released in the nuclear reaction given above.

(1) 23.6 MeV

(2) 24.1 MeV

(3) 5.9 MeV

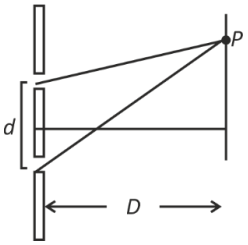
(4) 3 MeV

Answer (1)

Sol. $\Delta E = 7 \times 4 - 2 \times 2.2$

$\Rightarrow 23.6$ MeV

5. In standard YDSE wavelength λ = 7000 Å, d = 5 mm; D = 50 cm. I_0 is the intensity due to individual source on the screen. P is the point on screen such that intensity at 'P' is equal to I_0. Find the minimum distance of 'P' from center of screen.



(1) 35 μm

(2) $\frac{70}{3}$ μm

(3) 17.5 μm

(4) 50 μm

Answer (2)

Sol. $A^2 = A_0^2 + A_0^2 + 2A_0^2\cos\phi$

$\Rightarrow A^2 \propto I_0$

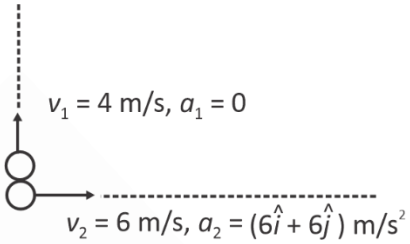
So, $I_0 = 2I_0(1+\cos\phi)$

So $\cos\phi = -\frac{1}{2} \quad \Rightarrow \phi = \frac{2\pi}{3}$

So distance of 'P' will be $\frac{\lambda D}{d \times 3}$

$\Rightarrow \gamma = \frac{7000 \times 10^{-10} \times 50}{100 \times 5 \times 10^{-3} \times 3} = \frac{70}{3}$ μm

6. For two equal masses. One of the mass is having initial velocity $v_1 = 4$ m/s $\hat{j}$ and acceleration $a_1 = 0$ m/s^2. Other having initial velocity of $v_2 = 6$ m/s $\hat{i}$ and acceleration $a_2 = (6\hat{i} + 6\hat{j})$ m/s^2. Initially both were located at origin. Find the trajectory of center of mass.



(1) Circular (2) Ellipse

(3) Parabolic (4) Straight line

Answer (3)

Sol. for (1) $x_1 = 0$; $y_1 = 4t$

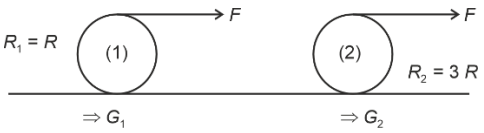
For (2) $x_2 = \left(6t + \frac{1}{2} \times 6t^2\right) = 6t + 3t^2$

$y^2 = 3t^2$

Center of mass is having constant acceleration which is not along the direction of initial velocity.

So trajectory will be parabolic

7. Solid sphere (1) of mass 5 M, hollow sphere (2) of mass M are pulled tangentially without slipping. Acceleration a_1 and a_2 are in ratio of____. Radius are shown in diagram



(1) $\frac{5}{21}$ (2) 1

(3) $\frac{3}{7}$ (4) $\frac{5}{3}$

Answer (1)

Sol. $\frac{a_1}{a_2}=\frac{F(2R)R\times\frac{5}{3}M(3R)^2}{\frac{7}{5}(5M)R^2\times F(6R)3R}$

$=\frac{2\times15}{7\times18}=\frac{10}{7\times6}=\frac{5}{21}$

8. When mass 200 g hangs from ceiling via spring in equilibrium, the extension in the spring is observed to be 2 mm. Find angular frequency of its SHM & energy stored in spring in equilibrium position respectively

(1) 50 rad/s & 2 mJ

(2) $50\sqrt{2}$ rad/s & 2 mJ

(3) 100 rad/s & 4 mJ

(4) 150 rad/s & 4 mJ

Answer (2)

Sol. $K=\frac{mg}{x}$

$\omega=\sqrt{\frac{K}{m}}$

$\omega=\sqrt{\frac{g}{x}}$

$\Rightarrow \omega=\sqrt{\frac{10}{2\times10^{-3}}}$

$\Rightarrow \omega=\frac{100}{\sqrt{2}}=50\sqrt{2}$

Also $U=\frac{1}{2}Kx^2$

$\Rightarrow \frac{1}{2}\frac{mg}{x}x^2$

$\Rightarrow \frac{1}{2}mgx$

$\Rightarrow \frac{1}{2}\times\frac{200}{1000}\times10\times2\times10^{-3}$

$\Rightarrow 2\times10^{-3}$ J

9. 2 moles of ideal mono-atomic gas at temperature T and 6 moles of ideal diatomic gas at temperature $2T$ are mixed together. Find the equilibrium temperature of mixture.

(1) $\frac{13}{6}T$ (2) $\frac{11}{8}T$

(3) $\frac{13}{8}T$ (4) $\frac{11}{6}T$

Answer (4)

Sol. $2\cdot\frac{3}{2}R(T)+6\cdot\frac{5}{2}R(2T)$

$=2\times\frac{3}{2}RT_0+6\times\frac{5}{2}RT_0$

$\Rightarrow RT(3+30)=RT_0(3+15)$

$\Rightarrow T_0=\frac{33T}{18}=\frac{11}{6}T$

10. an inclined plane is inclined at angle 45° with horizontal. If a block is released an it, it takes twice the time for it to come down compared to if it was smooth. Find friction coefficient of the inclined plane.

(1) $\frac{1}{2}$ (2) $\frac{1}{4}$

(3) $\frac{3}{4}$ (4) 1.2

Answer (3)

Sol. $t = \sqrt{\frac{2S}{a}}$

If time is twice that means acceleration must be one fourth.

$\therefore$ mg sin45° – μmg cos45° = $\frac{mg}{4\sqrt{2}}$

$\Rightarrow 1(1-\mu) = \frac{1}{4}$

$\boxed{\mu = \frac{3}{4}}$

11. Spherical charged body having potential 100 volt and capacitance C_0 = 100 μF is brought into contact with identical (uncharged) spherical body. Find the loss of energy.

(1) 250 mJ (2) 100 mJ

(3) 50 mJ (4) 150 mJ

Answer (1)

Sol. Initial charge $Q = C_0V_0$

$E(c) = \frac{C_0V_0^2}{2}$

Finally $E(f) = \frac{\left(C_0V_0^2\right)}{2\times 2C_0} = \frac{C_0V_0^2}{4}$

So $\Delta u = \frac{C_0V_0^2}{4} = \frac{100\times 10^{-6}\times 10^4}{4}$

Δu = 250 mJ

12. Propagation vector $\vec{K}$ & electric field vector $\vec{E}$ of an EMW of angular frequency ω is given. Magnetic field will be

(1) $\frac{\vec{E}\times\vec{K}}{\omega}$

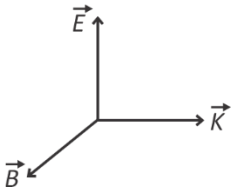
(2) $(\vec{E}\times\vec{K})\omega$

(3) $\frac{\vec{K}\times\vec{E}}{\omega}$

(4) $(\vec{K}\times\vec{E})\omega$

Answer (3)

Sol.



$\frac{\vec{K}\times\vec{E}}{KE} = \frac{\vec{B}}{B}$

$\frac{\vec{K}\times\vec{E}}{\frac{\omega}{C}CB} = \frac{\vec{B}}{B}$

13. Match the following lists and choose correct options:

List-I		List-II	
A	h(Planck's constant)	1	$ML^0T^{-3}K^{-4}$
B	G(Gravitational constant)	2	$M^1L^2T^{-1}$
C	σ (Stefans constant)	3	$M^1L^2T^{-2}k^{-1}$
D	k (Boltzmann constant)	4	$M^{-1}L^3T^{-2}$

(1) A → 2; B → 4 ; C → 1; D → 3

(2) A → 2; B → 4 ; C → 2; D → 1

(3) A → 2; B → 1 ; C → 4; D → 3

(4) A → 1; B → 2 ; C → 3; D → 4

Answer (1)

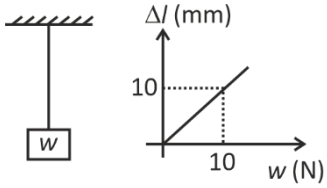
Sol. $\{G\} = M^{-1}L^3T^{-2}$

$\{\sigma\} = ML^0T^{-3}k^{-4}$

$\{n\} = ML^2T^{-1}$

$\{k\} = ML^2T^{-2}k^{-1}$

14. Graph is between weight of *b* block & extension in wire. Area of cross-section of wire is 10^{-5} m^2 & length 1 m. Find its Youngs modulus.



(1) 10^{11} N/m^2

(2) 10^8 N/m^2

(3) 10^{12} N/m^2

(4) 10^{10} N/m^2

Answer (2)

Sol. $Y = \frac{Fl}{A\Delta l}$

$\Rightarrow Y = \frac{10 \times 1}{10^{-5} \times 10 \times 10^{-3}}$

$Y = 10^8\ \text{N/m}^2$

15. Galvanometer shows full deflection when shunted by 2 ohm & is fed with 500 mA. Instead when this galvanometer is used in series with 470 Ω resister, again it shows full deflection for at range of 10 V. Resistance of galvanometer is

(1) 45 Ω

(2) 50 Ω

(3) 60 Ω

(4) 25 Ω

Answer (2)

Sol. $I_g(G + R) = 10$

$I_g(G) = 2(500\ \text{mA} - I_g)$

$I_g(G + R) = 10$

$I_gG = 1 - 2I_g$

$I_g(G + 2) = 1$

$I_g(G + R) = 10$

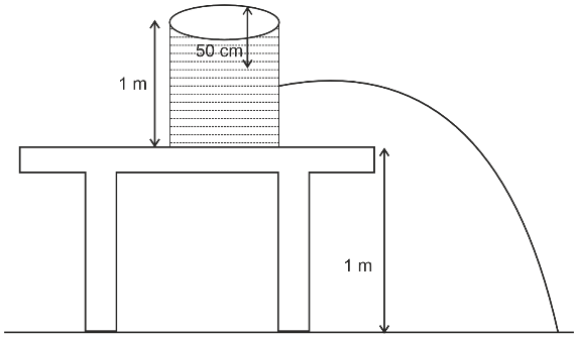
$\frac{G+2}{27+G} = \frac{1}{10}$

$10G + 20 = 270 + G$

$9G = 450$

$G = 50$

16. In diagram shown below, hole is made in completely filled cylinder 50 cm below the top. Find range covered by leaking water on ground.



(1) $\sqrt{3}$ m

(2) $\sqrt{2}$ m

(3) $\sqrt{4}$ m

(4) $\sqrt{6}$ m

Answer (1)

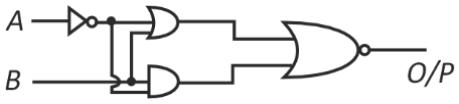
Sol. $V = \sqrt{2gh}$

$t = \sqrt{\frac{2 \times 1{\cdot}5}{g}}$

$\therefore$ Range $= \sqrt{2gh} \times \sqrt{\frac{2 \times 1{\cdot}5}{g}}$

$\Rightarrow \sqrt{2 \times \frac{1}{2} \times 3} = \sqrt{3}$ m

17. Find output for (1) $A = 0, B = 1$ & (2) $A = 1, B = 1$



(1) (1) 0, (2) 0

(2) (1) 1, (2) 1

(3) (1) 0 , (2) 1

(4) (1) 1, (2) 0

Answer (1)

Sol. $o/P = \overline{(\bar{A}+B)+\bar{A}\cdot B}$

$\Rightarrow \bar{\bar{A}}+B\cdot\bar{\bar{A}}\cdot B$

$\Rightarrow A\cdot\bar{B}\cdot(A+\bar{B})$

$\Rightarrow A\cdot\bar{B}+A\cdot\bar{B}$

$\Rightarrow A\cdot\bar{B}$

18.

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. If percentage change in radius of sphere is 2% then find the % change in the volume of sphere.

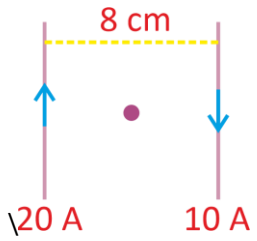
Answer (6)

Sol. $v = \frac{4}{3}\pi r^3$

$\frac{\Delta v}{v} = 3\left(\frac{\Delta r}{r}\right)$

So, $\left(\frac{\Delta v}{v}\times 100\right)$ = 3 × 2 = 6%

22. Magnetic field at middle of two parallel wires carrying current of 20 A and 10 A in opposite direction is ___ μT.

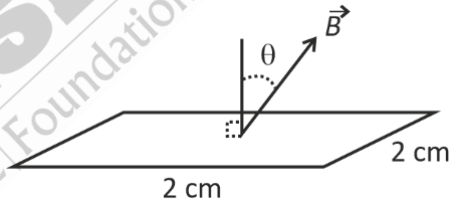


Answer (150)

Sol. $B = \frac{\mu_0(30)}{2\pi\times 4\times 10^{-2}} = 2\times 10^{-7}\times 7.5\times 10^2$

= 15 × 10^{-5}

23. The maximum magnitude of EMF induced in square loop of side 2 cm due to major ranging magnetic field $\vec{B} = 0.4\sin(300t)$ which is making θ = 60° with normal to plane of loop is *X* mV



Answer (24)

Sol. $\phi = Ba^2\cos\phi = a^2B_0\sin\omega t\cos\phi$

$\varepsilon = B_0a^2\cos\omega t\cos\phi$

$= 0.4\times 4\times 10^{-4}\times 300\times\frac{1}{2} = 150\times 1.6\times 10^{-4} = 24$ mV

24.

25.