

02/04/2026

Evening



# 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

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**100** Overall



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**100** Overall



HARSSH  
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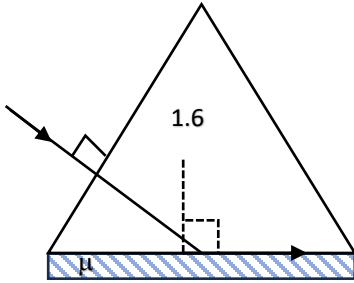
**PHYSICS**

**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. In equilateral prism the path of a ray is shown. Determine is



- (1) 1.71
- (2) 1.52
- (3) 1.39
- (4) 1.84

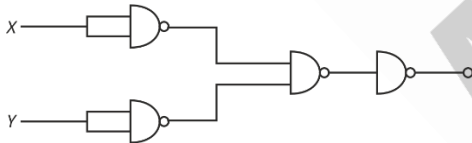
**Answer (3)**

**Sol.**  $\sin 60^\circ \cdot 1.6 = \mu \sin 90^\circ$

$$\Rightarrow \sqrt{3} \times 0.8 = \mu$$

$$\Rightarrow \mu = 1.39$$

2. What is the equivalent gate for the circuit.



- (1) AND gate
- (2) OR gate
- (3) NAND gate
- (4) NOR gate

**Answer (4)**

**Sol.**  $\overline{\overline{X} \cdot \overline{Y}} = X + Y$

Final output  $\overline{\overline{X} \cdot \overline{Y}}$

It is NOR gate

3. A soap bubble of radius  $r = 1\text{mm}$ , completely submerged in liquid of density  $\rho_1 = 2000\text{ kg/m}^3$ . At the instant bubble is rising upward with constant velocity  $v = \frac{1}{2}\text{ cm/s}$ . Find coefficient of viscosity ( $\eta$ ).

- (1)  $\frac{2}{9}\text{ N-s/m}^2$
- (2)  $\frac{4}{9}\text{ N-s/m}^2$
- (3)  $\frac{2}{3}\text{ N-s/m}^2$
- (4)  $\frac{8}{9}\text{ N-s/m}^2$

**Answer (4)**

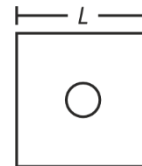
**Sol.**  $6\pi\eta r v = \frac{4}{3}\pi r^3 \rho_l g$

$$\Rightarrow \eta = \frac{4\pi r^3 \rho_l g}{3 \times 6\pi r v} = \frac{2}{9} \frac{r^2 \rho_l g}{v}$$

$$\Rightarrow \eta = \frac{2}{9} \times \frac{1 \times 10^{-6} \times 2000 \times 10 \times 2}{1 \times 10^{-2}}$$

$$\Rightarrow \eta = \frac{8}{9}\text{ N-s/m}^2$$

4. A small circular loop of radius  $r$  is completely in closed within a large square loop of length  $L$ . Both of the loops are concentric and co-planer. (Also  $L \gg r$ ). Find co-efficient of mutual induction.



- (1)  $M = \frac{\mu_0 r^2 2\sqrt{2}}{L}$
- (2)  $M = \frac{\mu_0 L^2}{\sqrt{2}r}$
- (3)  $M = \frac{2\mu_0 r^2}{L}$
- (4)  $M = \frac{\mu_0 r^2}{2L}$

**Answer (1)**

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**Sol.**  $B = \frac{\mu_0 I \times 2}{4\pi L} \times 2 \cdot \frac{1}{\sqrt{2}} \times 4 = \frac{\mu_0 I \times 4}{\pi L \sqrt{2}}$

$$\phi = \frac{(\pi r^2) \mu_0 I \times 4}{\pi L \sqrt{2}}$$

So  $M = \frac{\mu_0 r^2 2 \sqrt{2}}{L}$

5. Dimensions of  $G$  (Universal gravitational constant) in terms of  $h$  (Planck's constant),  $m$  (mass) and  $t$  (time) and  $L$  (length) will be

- (1)  $h^{-1} L m^{-2} t$                       (2)  $h L^{-1} m^2 t$   
 (3)  $h L m^{-2} t^{-1}$                       (4)  $h^{-1} L^{-1} m^2 t^{-1}$

**Answer (3)**

**Sol.** Planck mass  $m^2 = \frac{hc}{G}$

$$G = \frac{hc}{m^2} = \frac{hL}{m^2 t}$$

6. Position of a particle is given by  $x = a \sin(50t + \pi/3)$ . If speed and acceleration becomes zero for the first time at time  $t_1$  &  $t_2$  respectively. Then  $t_1$  &  $t_2$  are

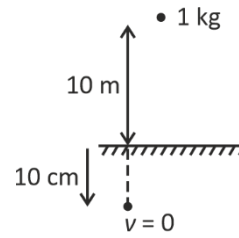
- (1)  $\frac{\pi}{150}, \frac{\pi}{300}$                       (2)  $\frac{\pi}{300}, \frac{\pi}{75}$   
 (3)  $\frac{\pi}{50}, \frac{\pi}{150}$                       (4)  $\frac{\pi}{300}, \frac{\pi}{150}$

**Answer (2)**

**Sol.**  $v = 50a \cos\left(50t + \frac{\pi}{3}\right)$        $v = 0 \Rightarrow t = \frac{\pi}{6 \times 50} = \frac{\pi}{300}$

$a = 50^2 a \sin\left(50t + \frac{\pi}{3}\right)$        $a = 0 \Rightarrow t = \frac{2\pi}{3 \times 50} = \frac{\pi}{75}$

7. A ball is released from rest as shown in figure. Ball comes to rest after moving 10 cm below the surface. Find average force applied by the floor material.



- (1) 800 N                                      (2) 1000 N  
 (3) 500 N                                      (4) 1200 N

**Answer (2)**

**Sol.**  $u = \sqrt{2 \times 10 \times 10} = 10\sqrt{2}$  m/s

$$v^2 = u^2 + 2as$$

$$0 = 200 + 2a \times 0.1$$

$$a = -1000 \text{ m/s}^2$$

$$\bar{F} = m\bar{a}$$

$$= 1 \times 1000$$

$$= 1000$$

8. In Bohr's atomic model. Find ratio of magnetic field produced at center by electron in 2<sup>nd</sup> orbit and 4<sup>th</sup> orbit.

- (1) 8    (2) 4  
 (3) 32    (4) 16

**Answer (3)**

**Sol.** We know  $r_{(n)} = \frac{r_0 n^2}{Z}$  &  $v = v_0 \frac{Z}{n}$

$$\text{So } I = \frac{ev}{2\pi r}$$

$$\beta = \frac{\mu_0 I}{2r} = \frac{\mu_0}{2r} \frac{ev}{2\pi r} = \frac{\mu_0 ev}{4\pi r^2}$$

Clearly  $\beta \propto \left(\frac{Z}{n}\right) \cdot \frac{Z^2}{n^4} \Rightarrow \beta \propto \frac{Z^3}{n^5}$

$$\text{So } \frac{\beta_{(2)}}{\beta_{(4)}} = \left(\frac{4}{2}\right)^5 = 32$$

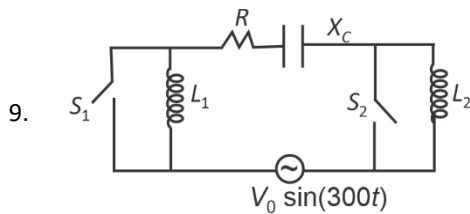
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In a given AC circuit if only switch  $S_1$  is closed then phase difference is  $30^\circ$  while only if only switch  $S_2$  is closed than phase difference is  $60^\circ$ . Current lags in both cases. If  $X_C = 30 \Omega$  then  $3L_1 - L_2$  is

- (1) 0.3 H
- (2) 0.5 H
- (3) 0.2 H
- (4) 10 H

**Answer (3)**

Sol.  $\frac{1}{\sqrt{3}} = \frac{L_1\omega - X_C}{R}$

$$\sqrt{3} = \frac{L_2\omega - X_C}{R}$$

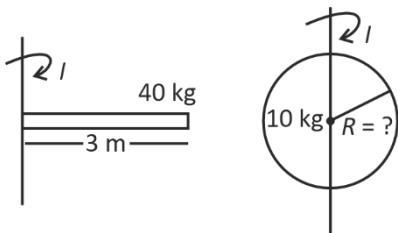
$$\Rightarrow \frac{1}{3} = \frac{L_1\omega - X_C}{L_2\omega - X_C}$$

$$3L_1\omega - 3X_C = L_2\omega - X_C$$

$$3L_1\omega - L_2\omega = 2X_C$$

$$3L_1 - L_2 = \frac{2X_C}{300} = \frac{X_C}{150} = \frac{30}{150} = 0.2$$

10. A rod of length 3 m and mass 40 kg has same moment of inertia as that of solid sphere. Find radius of solid sphere.



- (1)  $\frac{5}{2}$
- (2)  $\sqrt{30}$
- (3)  $\frac{3}{2}$
- (4)  $\sqrt{5}$

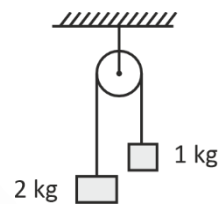
**Answer (2)**

Sol.  $\frac{ml^2}{3} = \frac{2}{5}MR^2$

$$\Rightarrow \frac{40 \times 9}{3} = \frac{2}{5} \times 10R^2$$

$$\Rightarrow R = \sqrt{30}$$

11. Find displacement of center of mass after  $t = 2$  sec.



- (1)  $\frac{20}{9}$

- (2)  $\frac{10}{9}$

- (3)  $\frac{25}{9}$

- (4)  $\frac{5}{9}$

**Answer (1)**

Sol.  $a = \frac{2g - g}{3} = \frac{g}{3}$

$$\text{So } x = \frac{1}{2} \times \frac{g}{3} \times 4 = \frac{2g}{3}$$

So shifting of COM

$$\Delta y = \frac{2\left(\frac{2g}{3}\right) - 1\left(\frac{2g}{3}\right)}{3} = \frac{2g}{9} = \frac{20}{9}$$

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16. Temperature of a gas is increased from 10 k to 20 k isochorically. Find heat absorbed by the 5 moles of the gas. ( $C_p = 8 \text{ cal/mol k}$ )
- (1) 340 J                      (2) 120 J  
(3) 520 J                      (4) 1260 J

**Answer (4)**

**Sol.**  $\phi = 5C_v\Delta T$   
 $= 50 \times 6 \times 4.2$   
 $= 1260 \text{ J}$

17. A mixture of 13.2 gram of  $\text{CO}_2$  &  $\text{O}_2$  gas is maintained at pressure = 100 kpa, volume  $v = 8310 \text{ cm}^3$  and temperature  $T = 300 \text{ K}$ . Find number of moles of  $\text{CO}_2$  &  $\text{O}_2$  respectively

- (1)  $\frac{2}{9}, \frac{1}{9}$                       (2)  $\frac{1.9}{9}, \frac{1.1}{9}$   
(3)  $\frac{1.6}{9}, \frac{1.4}{9}$                       (4)  $\frac{1.2}{9}, \frac{1.8}{9}$

**Answer (2)**

**Sol.**  $NRT = 100 \times 10^3 \times 8.31 \times 10^3 \times 10^{-6}$

$\Rightarrow N = \frac{8.31 \times 100}{8.31 \times 300} = \frac{1}{3}$

Also,  $N_1(44) + N_2(32) = 13.2$

$N_2 = \left(\frac{1}{3} - N_1\right)$

$44N_1 + \frac{32}{3} - 32N_1 = 13.2$

$\Rightarrow 12N_1 = \frac{7.6}{3} \Rightarrow N_1(\text{CO}_2) = \frac{1.9}{9} \text{ moles}$

And  $N_2 = \frac{1}{3} - \frac{1.9}{9} = \frac{1.1}{9} \text{ mole}$

18.  
19.  
20.

**SECTION - B**

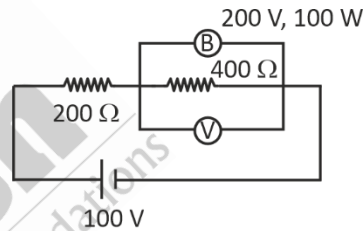
**Numerical Value Type Questions:** This section contains 5 Numerical based questions. The answer to each question should be rounded-off to the nearest integer.

21. Two point charges  $q_1 = +8\mu\text{C}$  and  $q_2 = -2\mu\text{C}$  are placed at  $x = 2$  and  $x = 4$  respectively. Consider two spherical Gaussian surfaces  $S_1$  and  $S_2$  centered at origin of radius 3 m and 5 m respectively. Electric flux through  $S_1$  and  $S_2$  is  $\phi_1$  and  $\phi_2$  then,  $\frac{3\phi_1}{\phi_2}$  \_\_\_\_\_

**Answer (4)**

**Sol.**  $\frac{\phi_1}{\phi_2} = \frac{8\epsilon_0}{\epsilon_0(8-2)} = \frac{8}{6} = \frac{4}{3}$

22. In a DC circuit a bulb (200 V, 100 W) is connected with 2 resistances and an ideal voltmeter as shown. Reading of voltmeter is V volt then V is



**Answer (50)**

**Sol.**  $R = \frac{V^2}{P} = \frac{200 \times 200}{100} = 400$

$R_{eq} = 200 + 400 \parallel 400$

$\Rightarrow V_B = V_{200} \Rightarrow V_B = V_V = 50 \text{ V}$

23. The intensity of sunlight, collected from equiconvex lens of  $R = 60 \text{ cm}$ , is observed to be maximum at distance of 30 cm from lens, then refractive index of material of lens is

**Answer (2)**

**Sol.**  $\frac{1}{f} = (\mu - 1) \frac{2}{R} \Rightarrow \frac{1}{30} = (\mu - 1) \frac{2}{60}$

$\Rightarrow \mu = 2$

24.  
25.

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