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JEE (MAIN) 2026

MEMORY BASED QUESTIONS & TEXT SOLUTION

SHIFT-2

DATE & DAY: 05th April 2026 & Sunday

PAPER-1

Duration: 3 Hrs.

Time: 03:00 – 6:00 IST

SUBJECT: PHYSICS

Selections in JEE (Advanced)/
IIT-JEE Since 2002

52979

Classroom: 35901 | Distance: 17078

Selections in JEE (Main)/
AIEEE Since 2009

262693

Classroom: 194471 | Distance: 68222

Selections in NEET (UG)/
AIPMT/AIIMS Since 2012

22733

Classroom: 15409 | Distance: 7324

Admission Open for 2026-27

Target: JEE (Advanced) | JEE (Main) | NEET (UG) | PCCP (Class V to X)

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PART : PHYSICS

1. In PN Junction, P side have high doping and N side is lightly doped then

- (1) depletion layer has more region in P side
- (2) depletion layer has more region in N side
- (3) depletion layer has equal region in both side.
- (4) There will be no depletion layer

Ans. (2)

Sol. Depletion layer always extends more in lightly doped semiconductor crystal.

2. Match the column according to dimensions

(A)	$\sqrt{\frac{GM}{C}}$	(1)	$M^{-1} L^2 T^{-3/2}$
(B)	$\sqrt{\frac{h^2}{GC}}$	(2)	$M^0 L^2 T^{-3/2}$
(C)	\sqrt{GMC}	(3)	$M^{3/2} L^0 T^0$
(D)	$\sqrt{\frac{GC}{M}}$	(4)	$LT^{-1/2}$

(1) A-1, B-2, C-3, D-4

(3) A-4, B-3, C-2, D-1

(2) A-4, B-3, C-1, D-2

(4) A-1, B-3, C-4, D-2

Ans. (3)

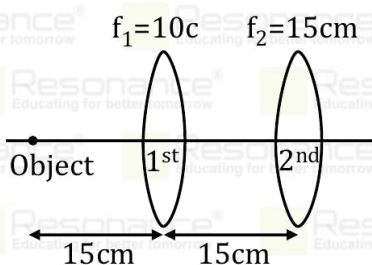
Sol. (A) $\sqrt{\frac{GM}{C}} = \frac{(M^{-1} L^3 T^{-2})^{1/2} (M)^{1/2}}{(LT^{-1})^{1/2}} = LT^{-1/2}$

(B) $\sqrt{\frac{h^2}{GC}} = \frac{ML^2 T^{-1}}{(M^{-1} L^3 T^{-2})^{1/2} (LT^{-1})^{1/2}} = M^{3/2} L^0 T^0$

(C) $\sqrt{GMC} = (M^{-1} L^3 T^{-2})^{1/2} (M^{1/2}) (LT^{-1})^{1/2} = M^0 L^2 T^{-3/2}$

(D) $\sqrt{\frac{GC}{M}} = \frac{(M^{-1} L^3 T^{-2})^{1/2} (LT^{-1})^{1/2}}{M^{1/2}} = M^{-1} L^2 T^{-3/2}$

3. Find distance of final image from 2nd lens.



(1) 15 cm

(2) ∞

(3) 7.5 cm

(4) 30 cm

Ans. (3)

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Sol. For 1st lens

$$u = -15 \text{ cm}; f = +15$$

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

$$\frac{1}{v} - \frac{1}{-15} = \frac{1}{15}$$

$$\frac{1}{v} = \frac{1}{15} - \frac{1}{15} = \frac{3-2}{30}$$

$$v = +30$$

For 2nd lens

$$u = +15; f = +15$$

$$\frac{1}{v} - \frac{1}{15} = \frac{1}{15}$$

$$\frac{1}{v} = \frac{1}{15} + \frac{1}{15} = \frac{2}{15}$$

$$v = \frac{15}{2} = 7.5 \text{ cm}$$

Final image is 7.5 cm right of 2nd lens.

4. A wheel initially at rest is subjected to a uniform angular acceleration about its axis. In the first 2 sec it rotates through an angle θ_1 and in the next 2 sec it rotates an angle θ_2 . Find the ratio of θ_2/θ_1 .

(1) 5

(2) 2

(3) 4

(4) 3

Ans. (4)

Sol. In first 2sec, $\theta_1 = \frac{1}{2}\alpha(2)^2$

$$\theta_1 = 2\alpha \quad (1)$$

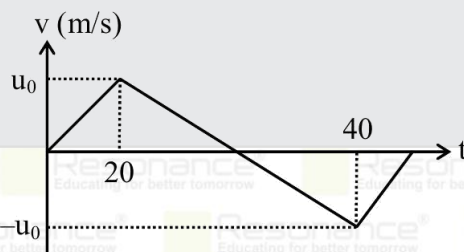
In first 4sec, $\theta' = \frac{1}{2}\alpha(4)^2 = 8\alpha$

In next 2 sec

$$\theta_2 = 8\alpha - 2\alpha = 6\alpha$$

$$\text{Ratio of } \frac{\theta_2}{\theta_1} = \frac{6\alpha}{2\alpha} = 3$$

5. Find magnitude of acceleration of particle at $t = 5$ sec. If velocity time graph is given as shown in figure.



(1) $\frac{u_0}{20}$

(2) $\frac{u_0}{40}$

(3) $\frac{u_0}{10}$

(4) u_0

Ans. (1)

Sol. Slope of v-t graph gives instantaneous acceleration

$$a = \left(\frac{dv}{dt}\right)_{\text{at } 5\text{sec}}$$

$$a = \left(\frac{u_0}{20}\right)$$

6. An electron travelling with velocity v in free space and when it enters a medium, its velocity is reduced by 20%. The de-Broglie wavelength of electron in the medium is $\alpha\lambda_0$, where λ_0 is deBroglie wavelength

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in free space. The value of α is:-

- (1) 1.25 (2) 1.5 (3) 0.8 (4) 0.125

Ans. (1)

Sol. $v_0 \rightarrow v_0 - 0.2v_0 = 0.8v_0$

$$\lambda \propto \frac{1}{v}$$

$$\frac{\lambda_1}{\lambda_2} = \frac{v_2}{v_1} = 0.8$$

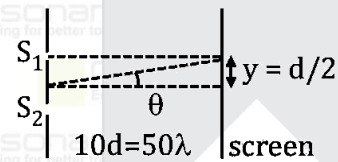
$$\lambda_2 = 1.25\lambda_0$$

7. In YDSE setup slit separation is $d = 5\lambda$, where λ is wavelength of light and screen is placed at distance $D = 10d$. If maximum intensity is I_0 , find intensity at a point directly in front of one of the slit.

- (1) I_0 (2) $\frac{I_0}{3}$ (3) $\frac{I_0}{2}$ (4) $\frac{I_0}{6}$

Ans. (3)

Sol.



Path difference $\Delta x = d \sin \theta$

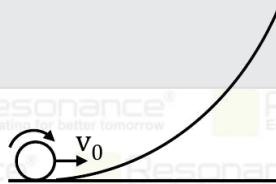
$$= \frac{dy}{\sqrt{\left(\frac{d}{2}\right)^2 + (10d)^2}}$$

$$\Delta x = \frac{d^2}{d\sqrt{1+400}} \approx \frac{d}{20} = \frac{5\lambda}{20} = \frac{\lambda}{4}$$

$$\Delta\phi = \frac{2\pi}{\lambda} \Delta x = \frac{2\pi}{\lambda} \times \frac{\lambda}{4} = \frac{\pi}{2}$$

$$I = I_0 \cos^2\left(\frac{\Delta\phi}{2}\right) = I_0 \cos^2\left(\frac{\pi}{4}\right) = \frac{I_0}{2}$$

8. If the rolling object reaches a maximum height $\frac{7}{10} \frac{v_0^2}{g}$. What may be the object?



- (1) Solid sphere (2) Ring (3) Disc (4) Hollow sphere

Ans. (1)

Sol. Using energy conservation

$$\frac{1}{2}mv_0^2 + \frac{1}{2}I_{\text{COM}} \times \left(\frac{v_0}{R}\right)^2 = mg \times \frac{7v_0^2}{10g}$$

$$I_{\text{COM}} \times \frac{1}{R^2} = \frac{2}{5} m$$

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$$I_{CM} = \frac{2}{5} mR^2$$

9. If x gm of water at 50°C cools to 0°C , the heat released is H . If $(100 - x)$ gm of water at 50°C is completely vapourised, the heat required is also H . Find x .

- (1) 8 gm (2) 20 gm (3) 92.18 gm (4) 80 gm

Ans. (3)

Sol.

x gm water

$50^\circ\text{C} \rightarrow 0^\circ\text{C}$

$$H = m\Delta T$$

$$H = x(1)(50 - 0)$$

$$H = 50x \quad \dots\dots(1)$$

$(100 - x)$

$50^\circ\text{C} \rightarrow 100^\circ\text{C}$ (Steam)

$$H = (100 - x)(1)(100 - 50) + (100 - x)(540) \dots (2)$$

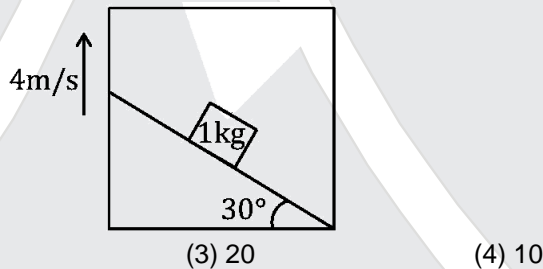
$$(1) = (2)$$

$$50x = 5000 - 50x + 54000 - 540x$$

$$640x = 59000$$

$$x = 92.18\text{gm}$$

10. Friction is sufficient so that the block do not slide.
Find work done by friction in 2 sec .



- (1) 45

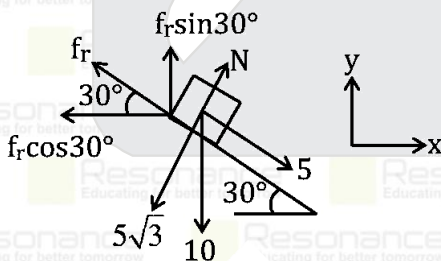
- (2) 40

- (3) 20

- (4) 10

Ans. (3)

Sol.



$$f_r = 5$$

$$(W_d)_f = (f_r)_y (\text{displacement})_y$$

$$(f_r)_y = f_r \sin 30^\circ = \frac{5}{2}$$

$$(\text{displacement})_y = 4 \times 2$$

$$(W_d)_f = \frac{5}{2} \times (4 \times 2) = 20$$

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11. A rod has volume V and young's modulus Y is subjected to stress τ . Find elastic energy stored in the rod.

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

Ans. (1)

Sol. $U = \frac{1}{2} \times \text{Stress} \times \text{Strain} \times \text{Volume}$

$$Y = \frac{\text{Stress}}{\text{Strain}}$$

$$\text{So, } U = \frac{1}{2} \times \frac{(\text{Stress})^2}{Y} \times \text{Volume}$$

$$U = \frac{1}{2} \times \frac{\tau^2 V}{Y}$$

12. Escape velocity on earth is $V_e = \sqrt{2gR}$. A planet of half the radius of earth and density is equal to that of earth the escape speed from that planet shall be $\frac{V_0}{N}$ then N is :

- (1) 4 (2) 6 (3) 2 (4) 8

Ans. (3)

$$\text{Sol. } V_e = \sqrt{2gR} = \sqrt{\frac{2GM}{R}} = \sqrt{\frac{2G}{R} \times \rho \times \frac{4}{3}\pi R^3}$$

$$V_e \propto R$$

$$\frac{V_1}{V_2} = \frac{R_1}{R_2}$$

$$\frac{V_e}{V_2} = \frac{R}{R/2}$$

$$\left\{ V_2 = \frac{V_e}{2} \right\}$$

13. 8 small liquid drops combined to form a bigger drop. Surface tension of liquid is T . Find change in surface potential energy.

- (1) $32\pi r^2 T$ (2) $16\pi r^2 T$ (3) $8\pi r^2 T$ (4) $6\pi r^2 T$

Ans. (2)

$$\text{Sol. } U_i = 8[T(4\pi r^2)]$$

$$U_i = 32\pi r^2 T \quad \dots\dots(1)$$

$$U_f = T[4\pi R^2]$$

\therefore volume is conserved

$$8 \left(\frac{4}{3} \pi r^3 \right) = \frac{4}{3} \pi R^3$$

$$R = 2r$$

$$\therefore U_f = T[4\pi(2r)^2]$$

$$U_f = 16\pi r^2 T \quad \dots\dots(2)$$

$$|\Delta U| = U_i - U_f$$

$$= 32\pi r^2 T - 16\pi r^2 T$$

$$|\Delta U| = 16\pi r^2 T$$

14. Find ratio of potential energy of a body at point A to point B for the figure shown.

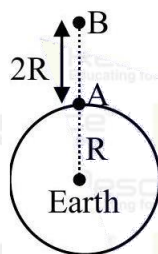
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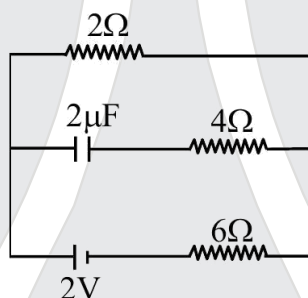


Ans. (3)

Sol.
$$U = -\frac{Gm_1 m_2}{r}$$

$$\frac{U_A}{U_B} \Rightarrow \frac{-\frac{GM_e m}{R}}{-\frac{GM_e m}{3R}} = \frac{3}{1}$$

15.



Find the voltage across capacitor in steady state.

- (1) 1 V (2) 0.5 V (3) 3/2 V (4) 4 V

Ans. (2)

Sol. At steady state current in capacitor branch is zero and voltage across capacitor is equal to voltage across 2Ω resistor.

$$V_C = V_{2\Omega} = \left(\frac{2}{2+6}\right) \times 2$$

$$V_C = 0.5 \text{ V}$$

16. Assertion: EM radiation when falls on a surface then it exerts pressure.

Reason: Radiation has no rest mass.

- (1) A&R both are correct and R is correct explanation of A
 (2) A & R both are correct but R is not correct explanation of A
 (3) A is correct but R is incorrect
 (4) A is incorrect but R is correct

Ans. (2)

Sol. Theory

17. Figure shows a circuit consisting of cell of emf E & internal resistance r connected in series with external resistance R .

When R = 5Ω then i = 1 A and

When R = 2Ω then i = 2 A

Find r. (in ohm)

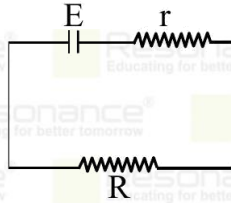
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Ans. (1)

Sol. Ohm's law $V = IR$

$$E = 1(5 + r)$$

$$E = 2(2 + r)$$

$$2(2 + r) = 1(5 + r)$$

$$4 + 2r = 5 + r$$

$$r = 1\Omega$$

18. A thin convex lens and a thin concave lens are kept coaxially in contact. Choose the correct option.

(1) Focal length is changed when the positions of lens are interchanged

(2) behaves as a convex lens when (f of convex $>$ f of concave)

(3) behaves as a concave lens (f of concave $>$ f of convex)

(4) behaves as a convex when (f of convex $<$ f of concave)

Ans. (4)

Sol. let f convex = $+f_1$

f concave = $-f_2$

$$\frac{1}{f_{eq}} = \frac{1}{f_1} - \frac{1}{f_2}$$

$$f_{eq} = \left(\frac{f_1 f_2}{f_2 - f_1} \right)$$

of $|f_2| > |f_1|$ then f_{eq} is +ve act like convex

of $|f_2| < |f_1|$ then f_{eq} is -ve act like concave

19. Find binding energy of ${}^6_6\text{C}$. Given mass of proton (m_p) = 1.0078u and mass of neutron (m_n) = 1.0087u

(1) 92.19 MeV

(2) 80.20 MeV

(3) 85.19 MeV

(4) 100.19 MeV

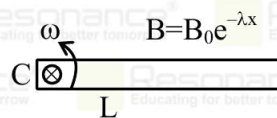
Ans. (1)

Sol. B.E. = $(Zm_p + (A - Z)m_n - M_{Atom})c^2$

$$= (6 \times 1.0078 + 6 \times 1.0087 - 12) \times 931.5 \text{MeV}$$

$$= 92.19 \text{MeV}$$

20. Magnetic field at a distance x from point C as shown in the figure on rod is $B_0 e^{-\lambda x}$, find induced emf between ends of metallic rod.



(1) $B_0 \omega (1 - e^{-\lambda L} (1 + \lambda L)) / \lambda^2$

(2) $B_0 \omega (L - e^{-\lambda L} (1 + \lambda L)) / \lambda^2$

(3) $B_0 \omega (L - e^{-2\lambda L} (1 + \lambda L)) / \lambda^2$

(4) $B_0 \omega (2L - e^{-\lambda L} (1 + \lambda L)) / \lambda^2$

Ans. (1)

Sol. Small emf

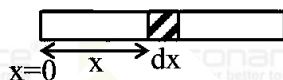
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$$\begin{aligned} d\varepsilon &= B(\omega x)dx \\ &= B_0 e^{-\lambda x} \omega x dx \\ &= B_0 \omega \int x \cdot e^{-\lambda x} dx \\ &= B_0 \omega \left(\frac{-e^{-\lambda x}}{\lambda^2} (\lambda x + 1) \right)_0^L \\ &= \frac{B_0 \omega}{\lambda^2} (1 - e^{-\lambda L} (1 + \lambda L)) \end{aligned}$$

21. There is metallic ring of radius 20 cm placed in uniform unsteady field $B = (2t^2 + 2t + 3)T$ perpendicular to plane of ring. If resistance of ring is 2Ω , find induced current at $t = 2\text{sec}$. [$\pi = 22/7$]
 (1) 0.63 Amp (2) 0.063 Amp (3) 0.3 Amp (4) 6.3 Amp

Ans. (1)

Sol. $\varepsilon = \frac{d\phi}{dt} = A \frac{dB}{dt}$
 $\varepsilon = \pi(20 \times 10^{-2})^2 \times (4t + 2)$
 $\varepsilon = 4\pi \times 10^{-2}(4t + 2)$
 at $t = 2\text{sec}$
 $\varepsilon = 0.4\pi$
 $I = \frac{\varepsilon}{R} = \frac{0.4\pi}{2} = 0.2 \times \pi$
 $= \frac{4.4}{7} = 0.628 \approx 0.63\text{Amp}$

22. If across a resistance, voltage applied is $(20 \pm 0.2)V$ and current passing through it is $(10 \pm 0.1)A$. Find maximum error in resistance :

- (1) 0.04 (2) 0.05 (3) 0.06 (4) 0.07

Ans. (1)

Sol. $\frac{\Delta R}{R} = \frac{\Delta V}{V} + \frac{\Delta I}{I}$
 $V = IR$
 $20 = 10R$
 $R = 2\Omega$
 $\frac{\Delta R}{2} = \frac{0.2}{20} + \frac{0.1}{10}$
 $\frac{\Delta R}{2} = \frac{0.4}{20}$
 $\Delta R = \frac{0.4}{10} = 0.04$
 $\Delta R = 0.04$

23. In a RLC series circuit the value of R, L and C is given as $R = 50\Omega$; $L = 1.6H$ and $C = 40\mu F$. Find the value inductive reactance (X_L) at resonance

- (1) 50Ω (2) 100Ω (3) 200Ω (4) 400Ω

Ans. (3)

Sol. At resonance

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$$X_L = X_C$$

$$\omega L = \frac{1}{\omega C}$$

$$\Rightarrow \omega = \frac{1}{\sqrt{LC}}$$

$$X_L = L\omega$$

$$= L \frac{1}{\sqrt{LC}} = \sqrt{\frac{L}{C}} = \sqrt{\frac{1.6}{40 \times 10^{-6}}}$$

$$= \sqrt{\frac{16 \times 10^6}{40 \times 10}} = 200\Omega$$

24. Match the column :

	Column-I		Column-II
(A)	$\sin^2 \omega t$	(P)	Non-periodic
(B)	$\cos(\omega t) + \cos(2\omega t)$	(Q)	Periodic but not SHM
(C)	$\sin^2(2\omega t)$	(R)	SHM with time period $\frac{\pi}{2\omega}$
(D)	$\cos(\pi + \omega t) + \cos(\omega t)$	(S)	SHM with time period $\frac{\pi}{\omega}$

(1) A-R, B-P, C-S, D-Q

(2) A-S, B-Q, C-R, D-P

(3) A-R, B-P, C-Q, D-S

(4) A-S, B-Q, C-P, D-R

Ans. (2)

Sol. (A) $\sin^2 \omega t \rightarrow$ SHM

$$\omega t = \pi$$

$$t = \frac{\pi}{\omega} \text{ (time period)}$$

(B) $\cos(\omega t) + \cos(2\omega t) \rightarrow$ not SHM

$$\omega t = 2\pi$$

$$t = \frac{2\pi}{\omega} \text{ (time period)}$$

(C) $\sin^2(2\omega t) \rightarrow$ SHM

$$2\omega t = \pi$$

$$t = \frac{\pi}{2\omega} \text{ (time period)}$$

(D) $\cos(\pi + \omega t) + \cos \omega t$

$$= -\cos \omega t + \cos \omega t = 0$$

Non-periodic

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