

**Resonance**  
Educating for better tomorrow

# JEE (Main) PAPER-1 (B.E./B. TECH.)

## 2023

### COMPUTER BASED TEST (CBT) Memory Based Questions & Solutions

Date: 24 January, 2023 (SHIFT-2) | TIME : (3.00 p.m. to 6.00 p.m)  
Duration: 3 Hours | Max. Marks: 300

**SUBJECT: PHYSICS**

---

**Resonance Eduventures Ltd.**  
Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005  
Ph. No.: +91-744-2777777, 2777700 | FAX No.: +91-022-39167222  
To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029  
Toll Free : 1800 258 5555 | 7340010333 | [facebook.com/ResonanceEdu](https://www.facebook.com/ResonanceEdu) | [twitter.com/ResonanceEdu](https://twitter.com/ResonanceEdu) | [www.youtube.com/resowatch](https://www.youtube.com/resowatch) | [blog.resonance.ac.in](https://blog.resonance.ac.in)

---

This solution was download from Resonance JEE (MAIN) 2023 Solution portal

### PART : PHYSICS

1. Two resistant  $R_1 = 100\Omega$  &  $R_2 = 100\Omega$  are connected in series with a battery of emf 90 V. Find voltage drop across  $R_2$  resistance.

drop across it resistance.

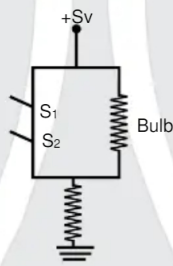
- (1) 45 V                      (2) 60 V                      (3) 70 V                      (4) 40 V

Ans. (1)

Sol.  $I = \frac{90}{100 + 100} = \frac{90}{200} \text{ A}$

$V_{R_1} = \frac{90}{200} \times 100 = 45 \text{ V}$

2. Identify the following gate.



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

Ans. (1)

Sol. Out put of the circuit  
Gate will be AND gate

A	B	Y
0	0	0
1	0	0
0	1	0
1	1	1

3. If one year of a planet is equal to 2.8 times earth's one year. Then the distance of planet from sun is nearly equal to :

- (1)  $4.2 \times 10^6 \text{ m}$                       (2)  $6.3 \times 10^6 \text{ m}$                       (3)  $3 \times 10^6 \text{ m}$                       (4)  $2.5 \times 10^6 \text{ m}$

Ans. (3)

Sol. Distance from sun to earth  
 $= 1.5 \times 10^6 \text{ m}$   
 $T_{\text{planet}} = 2.8 \text{ earth year}$   
Distance of planet from sun.

$\frac{T_1^2}{T_2^2} = \frac{R_1^3}{R_2^3}$

$\left(\frac{365}{2.8 \times 365}\right)^2 = \left(\frac{1.5 \times 10^6}{R_2}\right)^3$

$R_2^3 = (1.5)^3 \times 10^{18} \times (2.8)^2$

$R_2 \approx 3 \times 10^6 \text{ m}$

## Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/ResonanceEdu | twitter.com/ResonanceEdu | www.youtube.com/reswatch | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2023 Solution portal

PAGE # 1



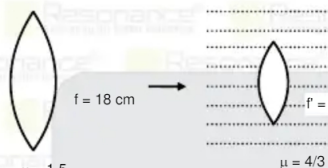
JEE (MAIN) 2023 | DATE : 24-01-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | PHYSICS

4. A convex lens whose refractive index is given 1.5 and focal length of 18 cm, has been immersed in liquid whose refractive index is  $\frac{4}{3}$ . Calculate what will be new focal length of the lens.

- (1) 60 cm                      (2) 55 cm                      (3) 72 cm                      (4) 85 cm

Ans. (3)

Sol.



$\frac{1}{f} = (\mu_r - 1) \left( \frac{1}{R_1} - \frac{1}{R_2} \right)$

$$f = \left(\frac{\mu_s}{\mu_a}\right) \left(\frac{R_1}{R_2}\right)$$

$$\frac{1}{18} = \left(\frac{3}{2} - 1\right) \left(\frac{1}{R_1} - \frac{1}{R_2}\right)$$

$$\left(\frac{1}{R_1} - \frac{1}{R_2}\right) = \frac{1}{9} \quad \dots(1)$$

$$\frac{1}{f'} = \left(\frac{\mu_r}{\mu_s} - 1\right) \left(\frac{1}{R_1} - \frac{1}{R_2}\right)$$

$$\left[\left(\frac{1}{R_1} - \frac{1}{R_2}\right) \text{ from equation (1)}\right]$$

$$\frac{1}{f'} = \left(\frac{3/2}{4/3} - 1\right) \left(\frac{1}{9}\right)$$

$$\frac{1}{f'} = \frac{1}{8} \times \frac{1}{9}$$

$$f' = 72 \text{ cm}$$

5. For a given same kinetic energy, what will be the order of de-Broglie wavelength of electron, proton and  $\alpha$ -particle ?

(1)  $\lambda_e < \lambda_p > \lambda_\alpha$       (2)  $\lambda_e > \lambda_p > \lambda_\alpha$       (3)  $\lambda_e < \lambda_p < \lambda_\alpha$       (4)  $\lambda_p < \lambda_e < \lambda_\alpha$

Ans. (2)

Sol.  $P = \sqrt{2m(\text{KE})}$

$$\frac{h}{\lambda} = \sqrt{2m(\text{KE})}$$

Hence  $\lambda \propto \frac{1}{\sqrt{m}}$

$$\lambda_e > \lambda_p > \lambda_\alpha$$

## Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/ResonanceEdu | twitter.com/ResonanceEdu | www.youtube.com/resowatch | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2023 Solution portal

PAGE # 2



JEE (MAIN) 2023 | DATE : 24-01-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | PHYSICS

6. If a conducting wire whose length is  $\ell$  has been stretched by 20% of its length. Then what will be the percentage change in the Resistance will be?

(1) 12      (2) 44      (3) 36      (4) 20

Ans. (2)

Sol.  $\frac{R_1}{R_2} = \left(\frac{\ell_1}{\ell_2}\right)^2 = \left(\frac{5}{6}\right)^2 = \frac{25}{36}$

$$\% \text{ change in resistance} = \frac{36-25}{25} \times 100 = 44\%$$

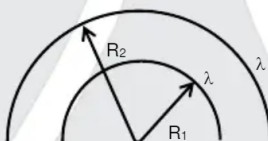
7. **Statement-I** : A simple pendulum will oscillate rapidly on the MOUNT EVEREST

**Statement-II** :  $g$  effective decreases as we go above from the earth surface.

- (1) Statement-1 is true, statement-2 is true and statement-2 is correct explanations of statement-1.  
 (2) Statement-1 is true, statement-2 is true but statement-2 is not correct explanations of statement-1.  
 (3) Statement-1 is true and statement-2 is false.  
 (4) Statement-1 is false and statement-2 is true.

Ans. (4)

8. There are two concentric half ring of radius  $R_1$  and  $R_2$  having linear charge density  $\lambda$  on each. Find potential at their common centre.



$$(1) \frac{\lambda}{\epsilon_0}$$

$$(2) \frac{\lambda}{4\epsilon_0}$$

$$(3) \frac{\lambda}{2\epsilon_0}$$

$$(4) \frac{4\lambda}{\epsilon_0}$$

Ans. (3)

Sol.  $V_0 = \frac{\lambda}{4\epsilon_0} + \frac{\lambda}{4\epsilon_0} = \frac{\lambda}{2\epsilon_0}$

9. A body of mass 1 kg is acted by a time dependent force  $\vec{F} = t\hat{i} + 3t^2\hat{j}$  time the power at  $t = 2$  sec.

(1) 50 W

(2) 100 W

(3) 150 W

(4) 200 W

Ans. (2)

Sol.

$t = 0$

$\vec{a} = t\hat{i} + 3t^2\hat{j}$

$d\vec{v} = \frac{t^2}{2}\hat{i} + t^3\hat{j}$  ;  $\vec{v} = \frac{t^2}{2}\hat{i} + t^3\hat{j}$

$P = \vec{F} \cdot \vec{v} = (t\hat{i} + 3t^2\hat{j}) \cdot \left(\frac{t^2}{2}\hat{i} + t^3\hat{j}\right) = \left[\frac{t^3}{2} + 3t^5\right]$

at  $t = 2$   $P = \frac{8^4}{2} + 3 \times 32 = 100$  watt.

## Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555

7340010333

facebook.com/ResonanceEdu

twitter.com/ResonanceEdu

www.youtube.com/resowatch

blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2023 Solution portal

PAGE # 3



JEE (MAIN) 2023 | DATE : 24-01-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | PHYSICS

10. If  $I_1$  is the moment of inertia of solid cylinder of radius  $R$  and length  $\ell$ . A concentric cylinder having radius  $\frac{R}{2}$  and length  $\frac{\ell}{2}$  is carved off from original cylinder and  $I_2$  is MOI of carved off cylinder. Find  $\frac{I_1}{I_2}$ .

(1) 16

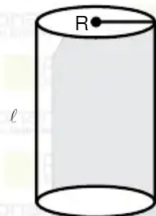
(2) 32

(3) 4

(4) 2

Ans. (2)

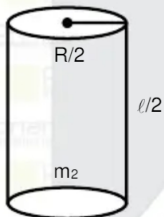
Sol. Thus  $\frac{I_1}{I_2} = 32$



MOI of solid cylinder

$$I_1 = \frac{1}{2} mR^2$$

$$\text{density} = \rho = \frac{m}{V} = \frac{m}{\pi R^2 \ell}$$



$$I_2 = \frac{m_2(R/2)^2}{2}$$

$$I_2 = \frac{1}{2} \frac{m}{\pi R^2 \ell} \times \pi \left(\frac{R}{2}\right)^2 \left(\frac{\ell}{2}\right) \left(\frac{R}{2}\right)^2$$

$$\text{where, } m_2 = \frac{m}{8} \times \pi \left(\frac{R}{2}\right)^2 \frac{\ell}{2}$$

$$I_2 = \frac{1}{2} \frac{mR^2}{32}$$

$$\frac{I_1}{I_2} = \frac{\frac{1}{2} mR^2}{\frac{1}{2} \frac{mR^2}{32}} = \frac{32}{1}$$

## Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | [facebook.com/ResonanceEdu](https://www.facebook.com/ResonanceEdu) | [twitter.com/ResonanceEdu](https://twitter.com/ResonanceEdu) | [www.youtube.com/resowatch](https://www.youtube.com/resowatch) | [blog.resonance.ac.in](https://blog.resonance.ac.in)

This solution was download from Resonance JEE (MAIN) 2023 Solution portal

PAGE # 4



| JEE (MAIN) 2023 | DATE : 24-01-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | PHYSICS

11. The Electric component and magnetic component for a electromagnetic component travelling in vacuum is given by  $E_x = E_0 \sin(kz - \omega t)$  and  $B_y = B_0 \sin(kz - \omega t)$ . Then which of the following is correct.

- (1)  $C = \frac{E_0}{B_0}$       (2)  $B_0 = E_0 C$       (3)  $E_0 = \frac{B_0}{C}$       (4)  $C = \frac{E_0}{B_0}$

Ans. (1)

Sol.  $E_0 = CB_0$

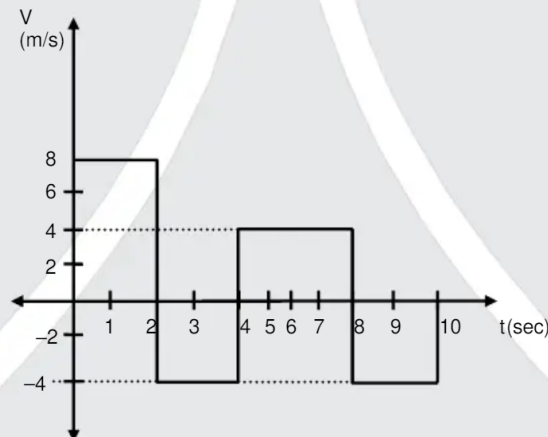
12. **Statement I** : Acceleration due to gravity decreases as we go at height 'h' above from the earth surface and 'd' depth below from the earth surface.

**Statement II** : If  $h = d$  then  $g_h = g_d$ , for all value of h and d.

- (1) Statement 1 is true and statement 2 is true and statement 2 is correct explanation of statement 1.  
 (2) Statement 1 is true and statement 2 is true but statement 2 is not correct explanation of statement 1.  
 (3) Statement 1 is true but statement 2 is false.  
 (4) Statement 1 is false but statement 2 is true.

Ans. (3)

13. A particle is moving one straight line its V-t graph is shown in the figure.



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

Ans. (2)

Sol.  $|\Delta \vec{r}| = 16 - 8 + 16 - 8 = 16$   
 distance =  $16 + 8 + 16 + 8 = 48$

Ans.  $\frac{1}{3}$

14. A mass m is attached to one end of spring and other end is fixed then it's time period is equal to 1 sec. if mass is increased by 3 kg then time period become 2 sec. Find mass m.

- (1) 1 kg      (2) 2 kg      (3) 3 kg      (4) 4 kg

Ans. (1)

## Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | [facebook.com/ResonanceEdu](https://www.facebook.com/ResonanceEdu) | [twitter.com/ResonanceEdu](https://twitter.com/ResonanceEdu) | [www.youtube.com/resowatch](https://www.youtube.com/resowatch) | [blog.resonance.ac.in](https://blog.resonance.ac.in)

This solution was download from Resonance JEE (MAIN) 2023 Solution portal

PAGE # 5



JEE (MAIN) 2023 | DATE : 24-01-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | PHYSICS

Sol. Using,  $T = 2\pi\sqrt{\frac{m}{k}}$

$$\frac{T_1}{T_2} = \frac{1}{2} = \frac{2\pi\sqrt{\frac{m_1}{k}}}{2\pi\sqrt{\frac{m_2}{k}}}$$

$$\frac{m_1}{m_2} = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$$

$$\frac{m_1}{m_1 + 3} = \frac{1}{4}$$

$$m_1 = 1 \text{ kg}$$

15. Let  $r_1$  and  $r_2$  be the ratio of molar heat capacity at constant pressure and constant volume for a monoatomic gas and a diatomic gas respectively. Find  $\frac{r_1}{r_2} = ?$

(1)  $\frac{25}{21}$

(2)  $\frac{28}{21}$

(3)  $\frac{30}{21}$

(4)  $\frac{35}{21}$

Ans. (1)

Sol. degree of freedom for monoatomic = 3,  $r_1 = 1 + \frac{2}{3} = \frac{5}{3}$

degree of freedom for diatomic = 5,  $r_2 = 1 + \frac{2}{5} = \frac{7}{5}$

$$\frac{r_1}{r_2} = \frac{5}{3} \times \frac{5}{7} = \frac{25}{21} \text{ Ans.}$$

16. On an infinite non conducting cylinder, there is a winding of 70 turns per  $\text{cm}^{-1}$  has been made of copper wire, If a 2A current is introduced in the copper winding. Calculate the magnetic field produced inside the cylinder (given :  $\mu_0 = 4\pi \times 10^{-7} \text{ TmA}^{-1}$ )

(1)  $120 \times 10^{-4} \text{ T}$  (2)  $125 \times 10^{-4} \text{ T}$  (3)  $160 \times 10^{-4} \text{ T}$  (4)  $176 \times 10^{-4} \text{ T}$

Ans. (4)

Sol.  $B = \mu_0 Ni$

$$= 4\pi \times 10^{-7} \times \frac{70}{10^{-2}} \times 2$$

$$= 4\pi \times 10^{-5} \times 70 \times 2$$

$$= 17.58 \times 10^{-3} \text{ T}$$

$$= 176 \times 10^{-4} \text{ T}$$

## Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

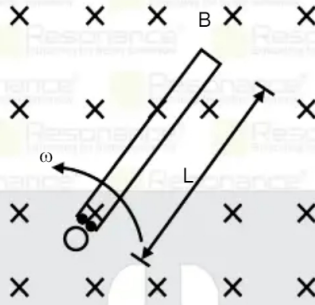
To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | [facebook.com/ResonanceEdu](https://www.facebook.com/ResonanceEdu) | [twitter.com/ResonanceEdu](https://twitter.com/ResonanceEdu) | [www.youtube.com/resowatch](https://www.youtube.com/resowatch) | [blog.resonance.ac.in](https://blog.resonance.ac.in)

This solution was download from Resonance JEE (MAIN) 2023 Solution portal

PAGE # 6

17. Find EMF induced when rod is rotating in uniform magnetic field as shown.



- (1)  $\frac{1}{2} B\omega L^2$       (2)  $B\omega L^2$       (3)  $\frac{3}{2} B\omega L^2$       (4)  $2B\omega L^2$

Ans. (1)

Sol.  $\varepsilon = VB\ell$

$$\int d\varepsilon = \int_0^L B(\omega x) dx$$

$$\varepsilon = B\omega \left[ \frac{x^2}{2} \right]_0^L$$

$$\varepsilon = \frac{B\omega L^2}{2}$$

18. If an electron jumps from energy level  $n = 4$  to  $n = 1$  and release a single photon. Find out the wave length of emitted photon. (Consider Hydrogen atom)

- (1) 970.3Å      (2) 972.3Å      (3) 972.2Å      (4) 872.3Å

Ans. (2)

Sol.  $\frac{1}{\lambda} = RZ^2 \left( \frac{1}{n_1^2} - \frac{1}{n_2^2} \right) \quad \therefore \begin{bmatrix} n_1 = 1 \\ n_2 = 4 \end{bmatrix}$

$\frac{1}{\lambda} = R \left( \frac{1}{1} - \frac{1}{16} \right) \quad \therefore [z = 1 \text{ for Hydrogen}]$

$\frac{1}{\lambda} = R \frac{15}{16}$

$\lambda = \frac{16}{15} R = \frac{16}{15 \times 1.097 \times 10^7}$   
 $= 0.9723 \times 10^{-7}$   
 $= 972.3 \text{ \AA}$

## Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/ResonanceEdu | twitter.com/ResonanceEdu | www.youtube.com/resowatch | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2023 Solution portal

PAGE # 7

19. Match the following with correct range of electromagnetic waves used doing their operation

- |                      |                      |
|----------------------|----------------------|
| (a) F. M             | (i) 76 – 88 MHz      |
| (b) T.V (Television) | (ii) 5.92 – 6.42 GHz |
| (c) A. M             | (iii) 540 – 1600 KHz |
| (d) satellite        | (iv) 88 – 108 MHz    |

- (1) a – (iv)      b – (i)    c – (iii)    d – (ii)  
 (2) a – (iii)     b – (ii)    c – (i)    d – (iv)  
 (3) a – (ii)      b – (i)    c – (iv)    d – (iii)  
 (4) a – (i)        b – (iii)    c – (iv)    d – (ii)

Ans. (1)

20. An oscillating liquid drops frequency depends on radius (r) density ( $\rho$ ) and surface tension is as  $r = r^a \cdot \rho^b \cdot s^c$  find a, b and c.

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

Ans. (3)

Sol.  $[r] = [c]$

$$\rho = \frac{m}{v} = ML^{-3}$$

$$S = \frac{F}{\ell} = \frac{MLT^{-2}}{L} = MT^{-2}$$

$$r = \frac{1}{T} = T^{-1}$$

$$T^{-1} = L^a \cdot [ML^{-3}]^b \cdot [MT^{-2}]^c$$

$$T^{-1} = L^{a-3b} \cdot M^{b+c} \cdot T^{-2c}$$

by comparing

$$a - 3b = 0 \quad b + c = 0 \quad +2c = +1$$

$$a - 3 \times \frac{-1}{2} = 0 \quad b = -\frac{1}{2} \quad c = \frac{1}{2}$$

$$a = -\frac{3}{2}$$

21. When a beam of light passes through a convex lens parallel to principal axis. Then different colours of light falls at different points on the principle axis. This phenomena is known as :

- (1) Chromatic Aberration                      (2) Diffraction  
 (3) Polarization                                (4) Spherical Aberration

Ans. (1)

## Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555    7340010333    facebook.com/ResonanceEdu    twitter.com/ResonanceEdu    www.youtube.com/resowatch    blog.resonance.ac.in

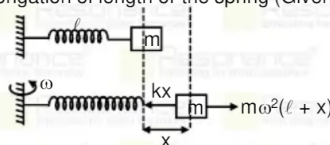
This solution was download from Resonance JEE (MAIN) 2023 Solution portal

PAGE # 8



JEE (MAIN) 2023 | DATE : 24-01-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | PHYSICS

22. If a spring whose natural length is  $\ell$  and stiffness k is fixed at one end and other end is connected with a block of mass m. If the block is rotated with respect to fixed end with  $\omega$  angular velocity. Then find the ratio of natural length and elongation of length of the spring (Given  $K = 12.5 \text{ N/m}$ ,  $m = 200 \text{ g}$ ,  $\omega = 5 \text{ rad/s}$ )



- (1) 2.5                      (2) 1.5                      (3) 1.2                      (4) 2.1

Ans. (2)

Sol.  $kx = m\omega^2(\ell + x)$

$$\frac{\ell + x}{x} = \frac{k}{m\omega^2}$$

$$\frac{\ell}{x} + 1 = \frac{12.5}{0.5 \times 25}$$

$$\frac{\ell}{x} = \frac{1}{0.5} - 1$$



$$x \quad 0.2 \times 2$$

$$\frac{\ell}{x} = \frac{10}{4} - 1 = \frac{6}{4} = \frac{3}{2}$$

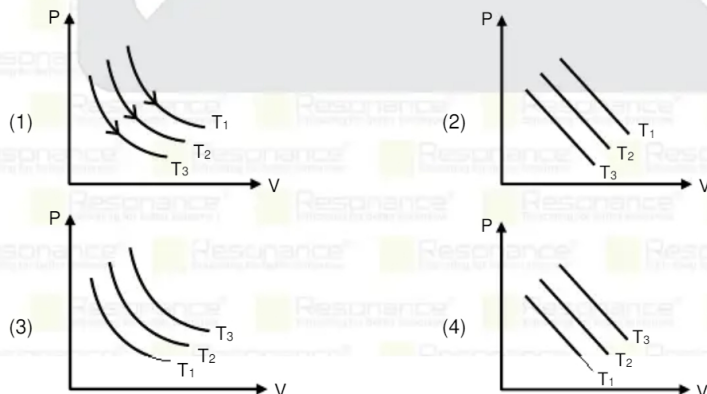
$$\frac{\ell}{x} = 1.5$$

23. **Statement-1** : Steel is used in the construction of bridges & roads.  
**Statement-2** : Steel is highly elastic, elastic strength is high.  
 (1) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1  
 (2) Statement-1 is True, Statement-2 is True; Statement-2 is **NOT** a correct explanation for Statement-1  
 (3) Statement-1 is True, Statement-2 is False  
 (4) Statement-1 is False, Statement-2 is True.

**Ans.** (1)

**Sol.** Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1

24. For an isothermal process which of the curve represent correct relationship between P v/s V for different temperature  $T_1, T_2, T_3$ .



## Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/ResonanceEdu | twitter.com/ResonanceEdu | www.youtube.com/resowatch | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2023 Solution portal

PAGE # 9

Resonance® | JEE (MAIN) 2023 | DATE : 24-01-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | PHYSICS

**Ans.** (1)

**Sol.**  $PV = nRT$

at constant temperature

$P \propto \frac{1}{V} \Rightarrow$  curved graph between  $P$  &  $V$

$\Rightarrow$  as  $V \uparrow$  is,  $P \downarrow$  is.

at temperature

$$P_1 = \frac{nRT_1}{V}$$

at temperature  $T_2$

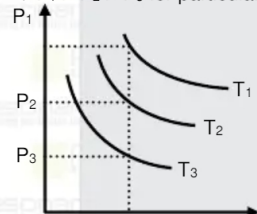
$$P_2 = \frac{nRT_2}{V}$$

at temperature  $T_3$

$$P_3 = \frac{nRT_3}{V}$$

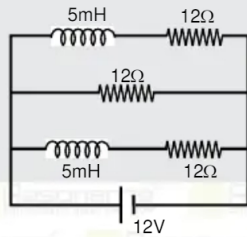
as  $T_1 > T_2 > T_3$

$\Rightarrow P_1 > P_2 > P_3$  for particular volume  $V$



25. There is a L-R circuit, which has these 12 ohm resistance and two inductor of 5mH. as shown in the figure is connected with a 12 V battery. Find the current producing from the battery after a very long time

time.



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

Ans. (2)

## Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555    7340010333    [facebook.com/ResonanceEdu](https://www.facebook.com/ResonanceEdu)    [twitter.com/ResonanceEdu](https://twitter.com/ResonanceEdu)    [www.youtube.com/resowatch](https://www.youtube.com/resowatch)    [blog.resonance.ac.in](https://blog.resonance.ac.in)

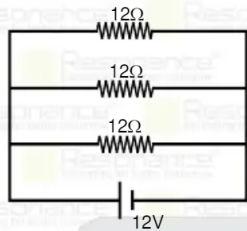
This solution was download from Resonance JEE (MAIN) 2023 Solution portal

PAGE # 10



| JEE (MAIN) 2023 | DATE : 24-01-2023 (SHIFT-2) | PAPER-1 | MEMORY BASED | PHYSICS

Sol. at  $t \rightarrow \infty$  insulator behaves as a closed circuit



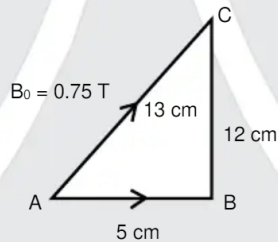
all resistors connected in parallel with battery

$$R_{eq} = \frac{R}{3} = \frac{12}{3} = 4\Omega$$

current from battery is equal to

$$i = \frac{V}{R_{eq}} = \frac{12}{4} = 3A$$

26. A right angle triangle has current of 2A. The edge length are shown in the diagram, magnetic field in acting in the plane of triangle parallel to wire AC. The magnetic force on the wire AB.



- (1)  $\frac{5}{130}$  N                      (2)  $\frac{15}{2}$  N                      (3)  $\frac{3}{40}$  N                      (4)  $\frac{9}{130}$  N

Ans. (4)

Sol.  $F = ILB \sin\theta$

$$= 2 \times \frac{5}{100} \times 0.75 \times \frac{12}{13}$$

$$= \frac{750 \times 12}{100 \times 100 \times 13} = \frac{9}{130} \text{ N}$$





Regular Test discussion  
classes for concept  
clearance



Back up support  
of recorded  
lectures

JEE (Main) 2022



**JEE (ADVANCED) 2022  
RESULT**

**RESONites ने फिर लहराया सफलता का परचम**

**STUDENTS FROM CLASSROOM PROGRAM (OFFLINE/ ONLINE)**

AIR

**6**

KARTHIKEYA  
POLISETTY  
Roll No.: 21925115



**AIR-1  
GEN-EWS**

AIR

**8**

DHEERAJ  
KURUKUNDA  
Roll No.: 21925114



**Students  
in TOP-100  
All India  
Ranks  
(AIRs)**



**AIR-11**

DEEVANSHU MALU  
Roll No.: 21210044



**AIR-15**

ABHIJEET ANAND  
Roll No.: 21925116



**AIR-35**

SANSKAR SHOURYA  
Roll No.: 21925113



**AIR-50**

ANURAG BANI  
Roll No.: 21220102



**AIR-54**

SOUMITRA D. NAYAK  
Roll No.: 21220564



**AIR-58**

KANISHK SHARMA  
Roll No.: 21220454

**ADMISSIONS OPEN FOR ACADEMIC SESSION 2023-24**

TARGET: JEE (Adv.) 2024

for Class XII Passed Student

**VISHESH COURSE**

MODE: OFFLINE / ONLINE

CLASS STARTS  
10<sup>th</sup> & 17<sup>th</sup> April

TARGET: JEE (Main) 2024

for Class XII Passed Student

**ABHYAAS COURSE**

MODE: OFFLINE / ONLINE

CLASS STARTS  
10<sup>th</sup> & 24<sup>th</sup> April

**SCHOLARSHIP ON THE BASIS OF JEE (MAIN) 2023 %ILE / AIR**

**Resonance Eduventures Limited**

REGISTERED & CORPORATE OFFICE: CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Rajasthan) - 324005  
Tel. No.: 0744-2777777, 2777700 | CIN: U80302RJ2007PLC024029

**Social Media Connect**



facebook.com/ResonanceEdu



83087 41444



youtube.com/@ResonanceEdu



l.me/OfficialResonance



instagram.com/resonance\_edu



in.linkedin.com/school/resonance-eduventures-td4/



twitter.com/ResonanceEdu