



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 S 7340010333 F facebook.com/ResonanceEdu www.youtube.com/resowatch blg.resonance.ac.in



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 S 7340010333 F facebook.com/ResonanceEdu www.youtube.com/resowatch blg.resonance.ac.in

Resonance[®] | JEE MAIN-2021 | DATE : 20-07-2021 (SHIFT-2) | PAPER-1 | MEMORY BASED | PHYSICS

| 6. R | A uniform rod of y | <mark>ou</mark> ng's modulus Y is stre | tched by two tension T ₁ | and T ₂ such th | nat rods get expanded | | |
|---------|---|--|--|------------------------------|-----------------------|--|--|
| | to length L1 and L | ² respectively. Find initial | length of rod ? | | | | |
| | (1) $\frac{L_1T_1 - L_2T_2}{T_1 - T_2}$ | (2) $\frac{L_2T_1 - L_1T_2}{T_2 - T_1}$ | (3) $\frac{L_1T_2 - L_2T_1}{T_2 - T_1}$ | (4) $\frac{L_1}{T_1} \times$ | $\frac{T_2}{L_2}$ | | |
| Ans. | (3) | | | | | | |
| Sol. | Le <mark>t ini</mark> tial length of | f rod be L ₀ and Area A. | | | | | |
| | $\Delta \mathbf{s} = \mathbf{T} - \mathbf{v} \Delta \ell$ | | | | | | |
| | A \overline{A} $\overline{\ell}$ | | | | | | |
| | So, $\frac{T_1}{A} = \frac{Y(L_1 - L_0)}{L_0}$ | <u>o)</u> | | | | | |
| | $\frac{T_2}{A} = \frac{Y(L_2 - L_0)}{L_0}$ | | | | | | |
| | Dividing | | | | | | |
| | $\frac{T_1}{T_2} = \frac{L_1 - L_0}{L_2 - L_0} ; T$ | $T_1L_2 - T_1L_0 = T_2L_1 - T_2L_0$ | ; $L_0 = \frac{L_1 T_2 - L_2 T_1}{T_2 - T_1}$ | | | | |
| 7. R | Time (T), velocity | (C) and angular momentime. In term of these, dir | ntum (h) are choosen as nension of mass would b | fundamental e : | quantities instead of | | |
| | (1) $[M] = [T^{-1}C^{-2}h]$ (2) $[M] = [T^{-1}C^{2}h]$ | | | | | | |
| | (3) [M] = [T ⁻¹ C ⁻² h ⁻ | -1] | (4) $[M] = [T^{-1}C^{-2}h]$ | | | | |
| Ans. | (1) | | | | | | |
| Sol. | M <mark>∝ T</mark> ×C ^y h² | | | | | | |
| | $M^{0}L^{0}T^{0}=T^{x}\left[LT^{-1}\right]$ | ^y [ML ² T ⁻¹] ^z | | | | | |
| | $M^{1}L^{0}T^{0} = T^{x-y-z} L^{y+z}$ | ^{-2z} M ^z | | | | | |
| | On comparing pov | wers | | | | | |
| | esonar ^z =1 | .(1) | | | | | |
| | x – y – z = | = 0(2) | | | | | |
| | y + 2z = 0 | tomorrow(3) Educating for bett | | | | | |
| | 2 S C N A Y + 2 × 1 : | | | | | | |
| | y x - (-2)-1 | = -2 = 0 | | | | | |
| | x = -1 | | | | | | |
| | $M \propto T^{-1}C^{-1}$ | ⁻² h ¹ | | | | | |
| | [M] ∝ [T ⁻¹ | C ⁻² h] | | | | | |
| | | | | | | | |

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
Toll Free : 1800 258 5555
Toll Free : 1800 258 5555



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 S 7340010333 F facebook.com/ResonanceEdu www.youtube.com/resowatch blog.resonance.ac.in

| 11. Re | For a body in pure ro | lling, its rota | ational kinetio | c energy is | 1/2 times of i | t <mark>s</mark> translatio | n kinetic energy. They |
|--------|---|-----------------|--|------------------------|------------------|-----------------------------|------------------------|
| | body should be ? | (2) Ring | | (3) solic | sphere | (4) Hollo | w sphere |
| Ans. | e:(1) nance | Resona | | Reson | ance | Reson | ance |
| Sol. | G <mark>iven</mark> | | | | | | |
| | $\frac{1}{2}I\omega^2 = \frac{1}{2} \times \frac{1}{2}mv^2$ | | | | | | |
| | as <mark>v =</mark> Rω (pure rollin | g | | | | | |
| | $\frac{1}{2}I\omega^2 = \frac{1}{4}mR^2\omega^2$ | | | | | | |
| | $I = \frac{1}{2} m R^2$ | | | | | | |
| | Thus, solid cylinder. | | | | | | |
| 12. | Magnetic susceptibilit | y of materia | al is 499 & µo | = 4π × 10 ⁻ | 7. SI unit then | find µr | |
| | (1) 500 | (2) 400 | | (3) 300 | | (4) 200 | |
| Ans. | (1) | | | | | | |
| Sol. | $\mu_r = 1 + \chi$ | | | | | | |
| | = 1 + 499 = 500 | | | | | | |
| 13. | A plane electromagn | etic wave | travels in fre | e space. I | Electric field i | $\vec{E} = E_0 \hat{i}$ | and magnetic field is |
| | represented by $\vec{B} - \vec{F}$ | k. What i | s the unit ve | ctor along | the direction (| of propagat | ion of electromagnetic |
| | wave? | , ₀ | | otor along | | or propugut | |
| | ating for better to | (2) – k | | (3) – î | | (4) ƙ | |
| Ans. | (3) | (-) | | (-)] | | | |
| Sol | Direction of EM wave | in aivon by | direction of | ĒvĒ | | | |
| 501. | | in given by | | | | | |
| | Unit vector in direction | n Ē×Ē ⇒ | $\frac{\mathbf{E} \times \mathbf{B}}{\left \mathbf{\vec{E}} \times \mathbf{\vec{B}} \right }$ | | | | |
| | | \Rightarrow | $\frac{E_0\hat{i}\timesB_0\hat{k}}{E_0B_0ssin90}$ | | | | |
| | | | - <u>0</u> -0 01100 | | | | |
| | | | i×k −î | | | | |
| | | | nee" | | | | |

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
Toll Free : 1800 258 5555
Toll Free : 1800 258 5555

| 14. R | Two satellites | o <mark>f m</mark> ass | s M_A and M_B a | are <mark>revo</mark> lving | around a p | olan <mark>et of</mark> ma | iss M in ra | dius R_A and R_B | |
|---|--|-------------------------|---|-------------------------------------|-----------------|----------------------------|--------------------------------|----------------------|--|
| | respectively. Then ? | | | | | | | | |
| | (1) <mark>Т</mark> а > Тв | | Ra <mark>> R</mark> b | (2) T _A > T _B | ifEducation | Ma > Mb | | | |
| | (3) $T_A = T_B$ | if 🖁 | Ma > Mb | (<mark>4) T</mark> a > Tb | onaince | Ra < Rb | | | |
| Ans. | (1) Resc | | | | | | | | |
| Sol. | $T \propto r^{3/2}$ | | | | | | | | |
| | $\frac{T_A}{T_A} \propto \left(\frac{R_A}{R_A}\right)^{3/2}$ | 2 | | | | | | | |
| | T _B (R _B) | | | | | | | | |
| 15. | If N₀ active nue | clei beco | mes $\frac{N_0}{16}$ in 80 | days. Find ha | If life of nucl | lei ? | | | |
| | (1) <mark>40</mark> days | | (2) 20 days | (3) | 60 days | (4) | 30 days | | |
| Ans. | (2) | | | | | | | | |
| Sol. | $N_0 \xrightarrow{t_{1/2}} \frac{N_0}{2}$ | $\xrightarrow{t_{1/2}}$ | $\frac{N}{4} \xrightarrow{t_{1/2}} \frac{N}{8} \xrightarrow{t}$ | $\frac{1/2}{16}$ | | | | | |
| | $4 \times t_{1/2} = 80 \text{ dat}$ | iys | | | | | | | |
| | t _{1/2} = 20 da | iys | | | | | | | |
| | | | | | | | | | |
| 16. | A satellite is re | evolving a | around a plane | t in an orbit of | radius R. S | Suddenly rad | ius of orbit | becomes 1.02 R | |
| - | th <mark>en w</mark> hat will | be perce | ntage change i | n its time peri | od of revolut | tion ? | | | |
| Ans. | | 2/2 | | | | | | | |
| Sol. | As I∝ R ⁱ | 3/2 D2/2 | | | | | | | |
| | $I_1 = K$ | R ^{3/2} | | | | | | | |
| Response $\frac{\Delta T}{T} = \frac{3}{2} \times \frac{\Delta R}{R} = 3\%$ | | | | | | | | | |
| | | | | | | | | | |
| 17. | A person walk | s up a st | ationary escala | tor in the time | e t1. If he rer | mains statior | ary on the | escalator, then it | |
| | can take him ι | ıp in time | t ₂ . Determine t | the time it wou | ıld take to w | alk up on the | e moving es | scalator ? | |
| | $t_1 t_2$ | | $t_1 t_2$ | (2) | $2t_1t_2$ | | 2t ₁ t ₂ | | |
| | $(1) \frac{1}{t_1 + t_2}$ | | $\frac{(2)}{t_1 - t_2}$ | Res | $t_1 + t_2$ | | $\overline{t_1 - t_2}$ | | |
| Ans. | (1) Response | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

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
Toll Free : 1800 258 5555
Toll Free : 1800 258 5555



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 : <u>contact@resonance.ac.in</u> | <u>CIN : U80302RJ2007PLC024029</u> Toll Free : 1800 258 5555 S 7340010333 f facebook.com/ResonanceEdu www.youtube.com/resowatch



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 S 7340010333 f facebook.com/ResonanceEdu www.youtube.com/resowatch blog.resonance.ac.in

🔨 Resonance" | JEE MAIN-2021 | DATE : 20-07-2021 (SHIFT-2) | PAPER-1 | MEMORY BASED | 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 : <u>contact@resonance.ac.in</u> | <u>CIN : U80302RJ2007PLC024029</u> Toll Free : 1800 258 5555 S 7340010333 f facebook.com/ResonanceEdu www.youtube.com/resowatch



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 S 7340010333 f facebook.com/ResonanceEdu www.youtube.com/resowatch blog.resonance.ac.in

Resonance" | JEE MAIN-2021 | DATE : 20-07-2021 (SHIFT-2) | PAPER-1 | MEMORY BASED | 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 S 7340010333 F facebook.com/ResonanceEdu www.youtube.com/resowatch blog.resonance.ac.in





26. Re I – V characteristic curve of a diode in forward bias is given in fig. find out dynamic resistance -

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
Toll Free : 1800 258 5555
Toll Free : 1800 258 5555



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
Toll Free : 1800 258 5555
Toll Free : 1800 258 5555



Toll Free: 1800 258 5555 | Visit us: www.resonance.ac.in 🛛 🗗 💆 🚨 🕔