PHYSICS

BOOKS - KCET PREVIOUS YEAR PAPERS

PHYSICS

Mcqs

1. A metal rod of length of 10 cm and a rectangular cross - section of 1 cm $\times \frac{1}{2}$ cm is

connected to a battery across apposite face .

The resistance will be .'

A. same irrespective of the three faces

B. maximum when the battery is connected across 1 cm $\times \frac{1}{2}$ cm faces

C. maximum when the battery is connected across 10 cm $\frac{1}{2}$ cm faces

D. maximum when the battery is connected across 10 cm $\times 1$ cm faces .

Answer:

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2. A car has a fresh storage battery of e.m.f 12 V and internal resistance $2 \times 10^{-2}\Omega$. If the starter motor draws a current of 80 A. Then the terminal voltage when the starter is on is .

A. 9.3 V

B. 12 V

C. 8.4 V

D. 10.4 V

Answer:

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3. When a soap bubble is charged ?

A. Its radius may increases or decrease .

B. Its radius increase

C. Its radius decreases

D. The radius remain the same .

Answer:

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4. A hot filamnet liberates an electron with zero intital velocity . The andoe potential is 1200 V. The speed of the electron when is strikes the anode is .

A. $2.5 \times 10^8 ms^{-1}$

B. $1.5 \times 10^5 ms^{-1}$

C. $2.5 \times 10^6 ms^{-1}$

D. $2.1 \times 10^7 ms^{-1}$

Answer:

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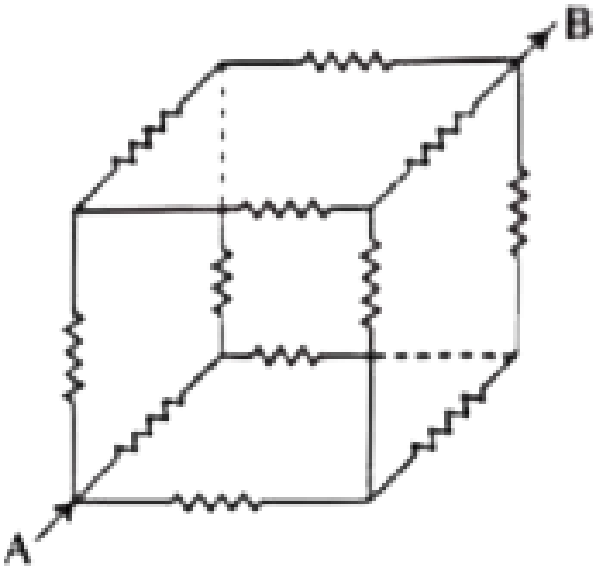
5. Each resistance is the given cubical network has resistance of 1Ω and equivalent resistance between A and B is .



A. $\frac{12}{5}\Omega$

B. $\frac{5}{6}\Omega$

C. $\frac{6}{5}\Omega$

D. $\frac{5}{12}\Omega$

Answer:

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6. A potentiometer has a uniform wire of length 5 m . A battery of emf 10 V and negligible interal resistance is connected

between its ends . A secondary cell connected to the circuit gives balancing length at 200 cm . The emf of the secondary cell is .

A. 8 V

B. 4 V

C. 6 V

D. 2 V

Answer:

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7. The colour code for a carbon resistor of resistance $0.28k\Omega \pm 10\,\%$ is

A. Red, Green , Silver

B. Red, Grey, Brown , Silver

C. Red, Green , Brow , sliver

D. Red , Grey , silver , Silver

Answer: Red, Grey, Brown , Silver

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8. The magnetic field at the orgini due to a current element $\overrightarrow{idl}$ placed at a point with vector position $\overrightarrow{r}$ is

A. $\frac{\mu_0 i}{4\pi} \frac{\overrightarrow{r} \times \overrightarrow{dl}}{r^2}$

B. $\frac{\mu_0 i}{4\pi} \frac{\overrightarrow{d}\, l \times \overrightarrow{r}}{r^3}$

C. $\frac{\mu_0 i}{4\pi} \frac{\overrightarrow{r} \times \overrightarrow{dl}}{r^3}$

D. $\frac{\mu_0 i}{4\pi} \frac{\overrightarrow{dl} \times \overrightarrow{r}}{r^2}$

Answer:

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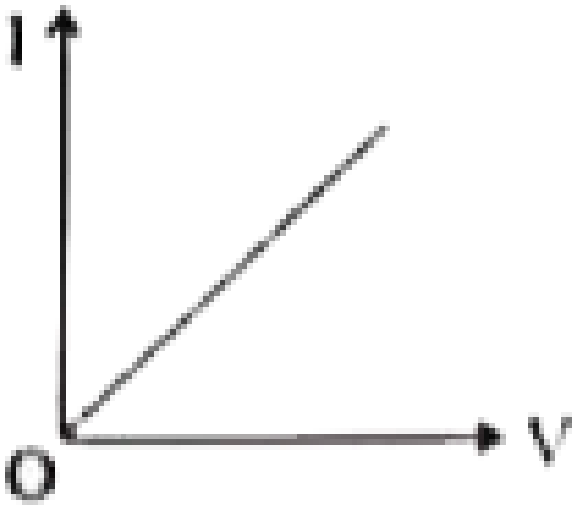
9. I- V characteristic of a copper wire of length of L and area of cross - section A is shown in figure . The slope of the curve becomes .



A. Less if the length of the wire is increased

B. More if experiment is performed at higher temperature

C. More if a wire of steel of same dimesion is used

D. Less if the area o the wire is increased

Answer:

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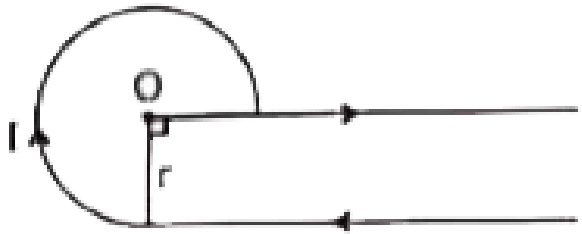
10. In the given figure , the magnetic field at 'O'.



A. $\frac{3}{8}\frac{\mu_o I}{r} - \frac{\mu_o I}{4\pi r}$

B. $\frac{3}{4}\frac{\mu_o I}{r} + \frac{\mu_o I}{4\pi r}$

C. $\frac{3}{10}\frac{\mu_0 I}{r} - \frac{\mu_0 I}{4\pi r}$

D. $\frac{3}{8}\frac{\mu_o I}{r} + \frac{\mu_o I}{4\pi r}$

Answer:

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11. A paramagentic sample shows a net magnetization of $8Am^{-1}$ when placed in an external magentic field of 0.6 T at a temperature of 4 k .When the same sample is placed in a external magnetic field of 0.2 T at temperature of 16 K . The magnetization will be .

A. $2.4Am^{-1}$

B. $\frac{32}{3}Am^{-1}$

C. $\frac{2}{3}Am^{-1}$

D. $6Am^{-1}$

Answer:

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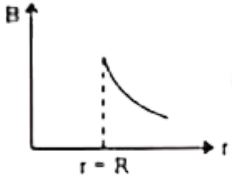
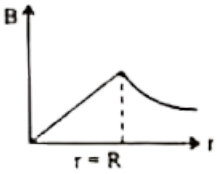
12. A long cylinder wire of radius R carries a unifrom current I flowing through it. The varaiaiton of magnetic field with distance 'r' from the axis of the wire is shown by .

A. 

B. 

C. 

D. 

Answer:

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13. A cylotron is used to accelearate protons $\left({}_{1}^{1}H\right)$. Deuterons $\left({}_{1}^{2}H\right)$ and α - particles $\left({}_{2}^{4}He\right)$. While exiting under similar conditions , the minimum K. E is gained by .

A. same for all

B. α - particle

C. proton

D. deuteron

Answer:

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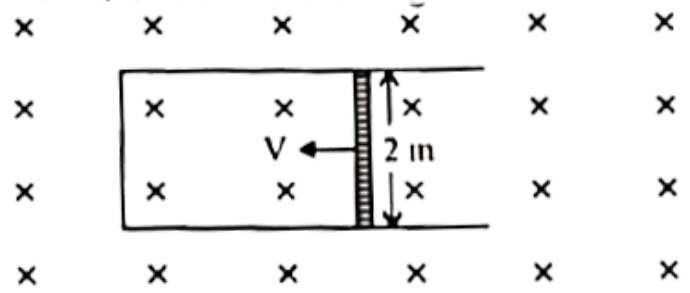
14. A rod of length 2 m slides with a speed of $5ms^{-1}$ on a rectangle conducting farme as shown in figure . There exists a unifrom magnetic field of 0.04 T perpendicular to the plane of the figure. If the resistance of the rod is 3Ω . The current through the rod is .



A. 1.33 A

B. 75mA

C. 133mA

D. 0.75A

Answer:

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15. The ratio of magnetic field at the centre of a current carrying circular coil to its magnetic moment is 'r'. If the current and the radius both are doubled. The new ratio will become

A. $\frac{x}{8}$

B. $2x$

C. $4x$

D. $\frac{x}{4}$

Answer:

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16. In a permanent magnet at room temperature

A. Domains are all perfectly aligned.

B. Magnetic moment of each molecule is zero.

C. The individual molecules have non-zero magnetic moment which are all perfectly aligned.

D. Domains are partially aligned.

Answer:

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17. The power factor of R-L circuit is $\frac{1}{\sqrt{3}}$.If the inductive reactance is 2Ω. The value of resistance is

A. $\frac{1}{\sqrt{2}}\Omega$

B. 2Ω

C. $\sqrt{2}\Omega$

D. 0.5Ω

Answer:

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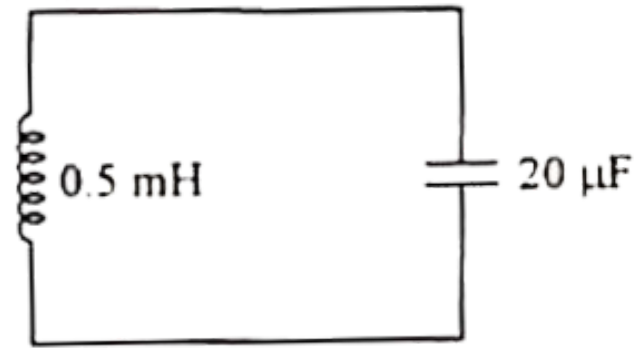
18. In the given circuit , the resonamt frequency is



A. 15910 Hz

B. 15.92 Hz

C. 159.2 Hz

D. 1592 Hz

Answer:

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19. The current in a coil of inductance 0.2 H changes from 5 A to 2 A in 0.5 sec. The magnitude of the average induced emf in the coil is

A. $0.3V$

B. $0.6V$

C. $1.2V$

D. $30V$

Answer:

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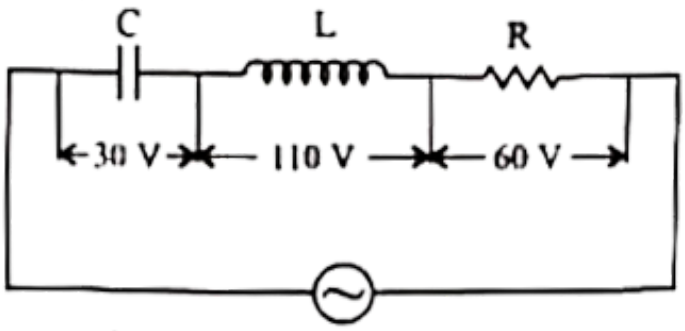
20. In the given circuit the peak voltages across C, L and Rare 30 V, 110 V and 60 V respectively. The rms value of the applied

voltage is .



A. 141 V

B. 100 V

C. 200 V

D. 70.7V

Answer:

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21. The refracting angle of a prism is A and refractive index of material of prism is $\cot \frac{A}{2}$. The angle of minimum deviation is

A. $180^\circ - 2A$

B. $180^\circ - 3A$

C. $180^\circ + 2A$

D. $90^\circ - A$

Answer:

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22. A light beam of intensity $20W/cm^2$ is incident normally on a perfectly reflecting surface of sides 25 cm x 15 cm. The momentum imparted to the surface by the light per second is

A. $1.2 \times 10^{-5} kgms^{-1}$

B. $2 \times 10^{-5} kgms^{-1}$

C. $1 \times 10^{-5} kgms^{-1}$

D. $5 \times 10^{-5} kgms^{-1}$

Answer:

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23. An object approaches a convergent lens from the left of the lens with a uniform speed 5 m/s and stops at the focus, the image

A. moves towards the lens with a non-uniform acceleration.

B. moves away from the lens with an uniform speed 5 m/s.

C. moves away from the lens with an uniform acceleration.

D. moves away from the lens with a non-uniform acceleration.

Answer:

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24. Two poles are separated by a distance of $3.14m$. The resolving power of humna eye is 1 minute of an arc. The maximum distance from

which he can identify the two poles distinctly is .

A. 376 m

B. 10.8 km

C. 5.4 km

D. 188 m

Answer:

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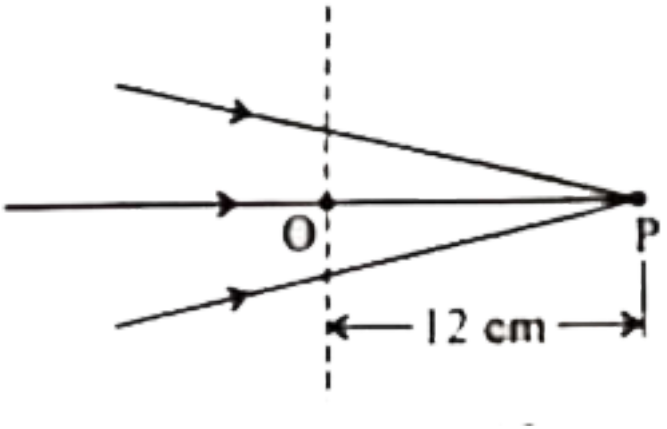
25. The following figure shows a beam of light converging at point P . When a concave lens of focal length 16 cm is introudced in the path of the beam at a place shown by the dotted line such that OP becomes the axis of the lens , the becam converges at a distane x from the lens. The vlaue of x will be equal to



A. 48 cm

B. 12 cm

C. 24 cm

D. 36 cm

Answer:

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26. Three polaroid sheets P_1, P_2 and P_3 are kept parallel to each other such that the angle between pass axes of P_1 and P_2 is 45° and

between P_2 and P_3 is 45° . If unpolarised beam of light of intensity $128Wm^{-2}$ is incident on P_1 . What is the intensity of light coming out of P_3 ?

A. $64Wm^{-2}$

B. $128Wm^{-2}$

C. 0

D. $16Wm^{-2}$

Answer:

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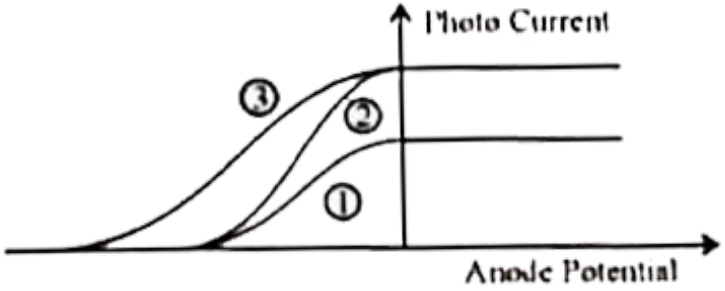
27. The following graph represents the variation of photo current with anode potential for a metal surface . Here l_1, l_2 and l_3 represents intensities and $\gamma_1, \gamma_2, \gamma_3$ respectively , them .



A. $\gamma_2 = \gamma_3$ and $I_1 \neq I_3$

B. $\gamma_1 = \gamma_2$ and $I_1 \neq I_2$

C. $\gamma_1 = \gamma_3$ and $I_1 = I_3$

D. $\gamma_1 = \gamma_2$ and $I_1 = I_2$

Answer:

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28. In Young's Double Slit Experiment the distance between the slits and the screen is $1.2m$ and the distance between the two slits is 2.4 mm. If a thin transparent mica sheet of thickness $1\mu m$ and $R.I.1.5$ is introduced

between one of the interfering beams , the shift in the position of central bright fringer is

A. 0.25 mm

B. 2 mm

C. 0.5 mm

D. 0.125mm

Answer:

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29. The de - Broglie wavelenght assoicated with electron of hydrogen atom in ths ground state is .

A. 10Å

B. 0.3Å

C. 3.3Å

D. 6.26Å

Answer:

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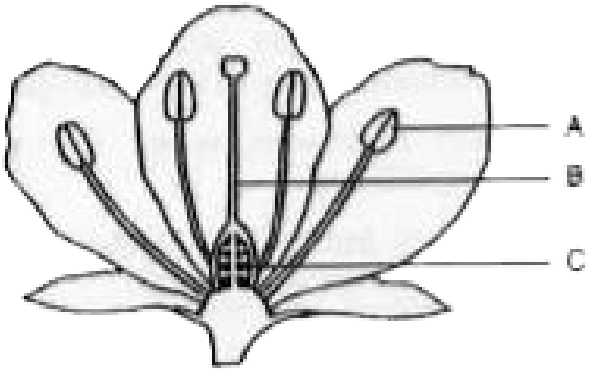
30. Name the parts A, B and C shown in the following diagram and state one function of each.



A. C' will be minimum and in B maximum

B. B' will be minimum and in C maximum

C. A' will be maximum and in B' minimum

D. A' will be minimum and in C maximum

Answer:

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31. The period of revolution of an electron revolving in n^{th} orbit of H - atom is propportinal to .

A. Independent of n

B. n°

C. $\frac{1}{n}$

D. n^3

Answer:

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32. Angular momentum of an electron in hydrogen atom is $\frac{3h}{2\pi}$ (h is the Planck's constant). The K. E of the electron is

A. $6.8eV$

B. $4.35eV$

C. $1.51eV$

D. $3.4eV$

Answer:

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33. A radio - active element has half - life of 15 years. What is the fractional that will decay in 30 years ?

A. 0.85

B. 0.25

C. 0.5

D. 0.75

Answer: 0.75

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34. Two protones are kept at a separation of 10 nm. Let F_n and F_e be the nuclear force and the elctromagnetic force between them .

A. F_e and F_n differe only slightly

B. $F_e = F_n$

C. $F_e > > F_n$

D. $F_e < < F_n$

Answer:

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35. During a β - decay

A. A proton in the nuclesus decays emitting electorn

B. an atomic electron is ejected

C. an electron which is already present within the nucleus is

D. A neutron in the nucleus decays emitting an electron

Answer:

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36. A positive hole in a semiconductor is

A. an articially created particles

B. an anti - particle of electron

C. a vacany created when an electron leaves covalent bond

D. absence of free electrons.

Answer:

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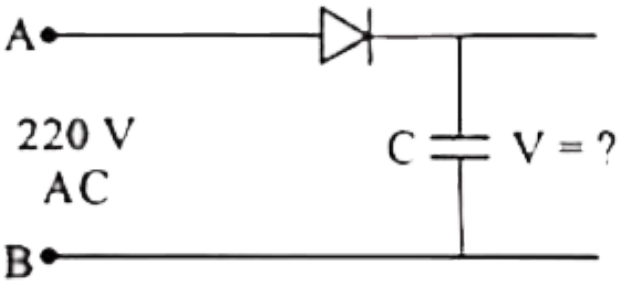
37. A 220 V A. C supply is connected between points A and B as shown in figure what will be the potential differnece V across the capacitor

?



A. $220\sqrt{2}V$

B. $220V$

C. 110

D. 0

Answer:

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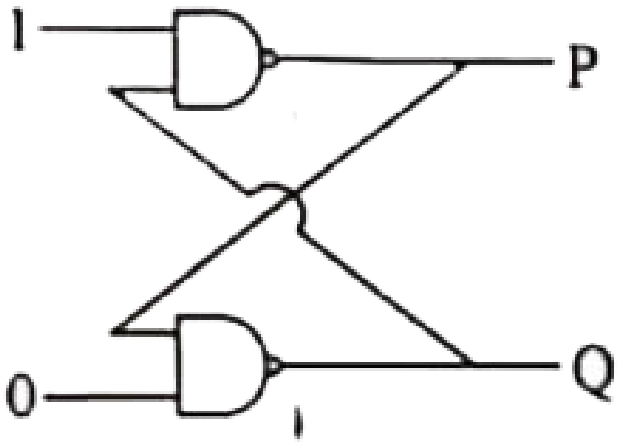
38. In the following circuit what are P and Q :



A. $P = 1, Q = 1$

B. $P = 1, Q = 0$

C. $P = 0, Q = 1$

D. $P = 0, Q = 0$

Answer: $P = 0, Q = 1$

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39. A body is intially at rest . It undergos one - dimensional motion with constant acceleration . The power delivered to it at time 't' is proportianal to .

A. $t^{1/2}$

B. t

C. $t^{3/2}$

D. t^2

Answer:

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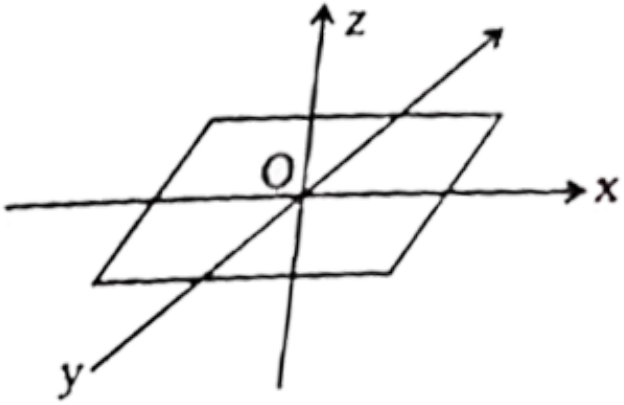
40. A thin uniform rectangular plate of mass 2 kg is placed X - Y plane as shown in figure . The moment of intertia about x - axis is $I_x = 0.2kgm^2$ and the moment of inertia about y - axis is $I_y = 0.3kgm^2$ .The radius of gyration of the plate about the axis passing

throught O and perpendicular to the plane of the plate is .



A. 50 cm

B. 5 cm

C. 38.7cm

D. 31.6 cm

Answer:

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41. One end of a string of length 'l' is connected to a particle of mass m and the other to a small peg on a smooth horizontal table . If the particle moves in a circle with speed 'v', the net force on the particle (directed towards the centre) is :(T is the tension in the string).

A. T

B. $T - \frac{mv^2}{l}$

C. $T + \frac{mv^2}{l}$

D. 0

Answer:

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42. Young 's modulus of a perfect rigied body is

A. zero

B. unity

C. infinity

D. between zero and unity

Answer:

43. A wheel starting from rest gains an angular velcoity of 10 rad/s after uniformly accelerated

for 5 sec. The total angle throught which it has turned is .

A. 25 rad

B. 100 rad

C. 25π rad

D. 50π rad about a vertical axis

Answer:

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44. Iceberg floats in water with part of it submerged. What is the fraction of the volumes of iceberg submerged if the density of ice is $\rho_i = 0.917 gcm^{-3}$?

A. 0.917

B. 1

C. 0.458

D. 0

Answer:

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45. The value of acceleartion due to gravity at a height of 10 km from the surface of earth is x. At what depth inside the ea rth is the value of the acceleration due to gravity has the same value x ?

A. 5 km

B. 20 km

C. 10 km

D. 15 km

Answer:

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46. In an adiabatic expansion of an ideal gas the product of pressure and volume .

A. Decreases

B. Increases

C. Remains constant

D. At first increase and then decrease

Answer:

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47. A certain amount of heat energy is supplied to a monoatomic ideal gas which expands ta constant pressure . What fration of the heat energy is conveted into work ?

A. 1

B. $\frac{2}{3}$

C. $\frac{2}{5}$

D. $\frac{5}{7}$

Answer:

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48. A sphere, a cube and a thin circular plate all of same material and same high temperatue are allowed to cool down under similar condition . Then the

A. plate will cool the faster and cube the slowest

B. sphere will cool the faster and cube the slowest

C. plate will cool the faster and sphere the slowest

D. cube will cool the faster and plate the slowest

Answer:

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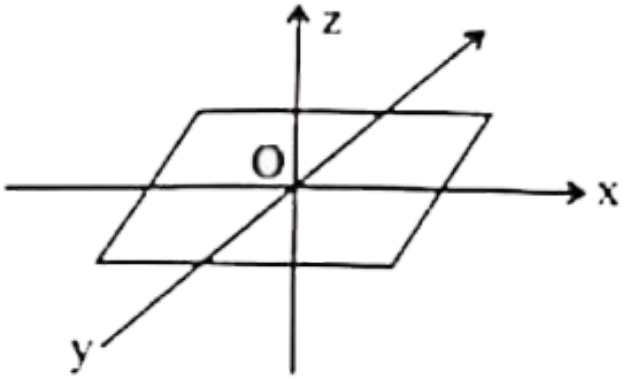

A. 31.6 cm

B. 50 cm

C. 5 cm

D. 38.7 cm

Answer:

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50. One end of a string of length 'l' is connected to a particle of mass m and the other to a small peg on a smooth horizontal table . If the particle moves in a circle with speed 'v', the net force on the particle (directed towards the centre) is :(T is the tension in the string).

A. 0

B. T

C. $T - \frac{mv^2}{l}$

D. $T + \frac{mv^2}{l}$

Answer:

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A. t^2

B. $t^{1/2}$

C. t

D. $t^{3/2}$

Answer:

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52. A wheel starting from rest gains an angular velcoity of 10 rad/s after uniformly accelerated

for 5 sec. The total angle throught which it has turned is .

A. 50π rad about a vertical axis

B. 25π rad

C. 100 rad

D. 25 rad

Answer:

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53. Iceberg floats in water with part of it submerged. What is the fraction of the volumes of iceberg submerged if the density of ice is $\rho_i = 0.917 gcm^{-3}$?

A. 0

B. 0.917

C. 1

D. 0.458

Answer:

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54. The value of acceleration due to gravity at a height of 10km form the surface of earth is x. At what depth inside the earth is the value of the acceleration due to gravity has the same value x?

A. 15 Km

B. 5 Km

C. 20 Km

D. 10 Km

Answer:

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55. Young 's modulus of a perfect rigied body is

A. between zero and unity

B. zero

C. unity

D. infinity

Answer:

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56. A certain amount of heat energy is supplied to a monoatomic ideal gas which expands ta constant pressure . What fration of the heat energy is conveted into work ?

A. $\frac{5}{7}$

B. 1

C. $\frac{2}{3}$

D. $\frac{2}{5}$

Answer:

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57. A sphere, a cube and a thin circular plate all of same material and same high temperatue are allowed to cool down under similar condition . Then the

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B. plate will cool the fastest and cube the slowest

C. sphere will cool the fastest and cube the slowest

D. plate will cool the faster and sphere the slowest

Answer:

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58. In an adiabatic expansion of an ideal gas the product of pressure and volume .

A. At first increase and then decreaes

B. Decreases

C. Increases

D. Reamains constant

Answer:

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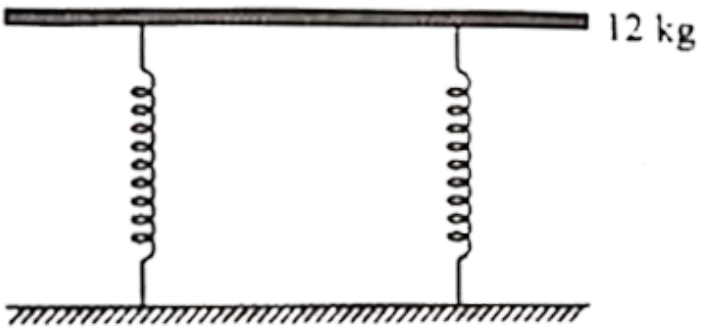
59. A tray of mass 12 kg is supported by tow identical spring as shown in figure. When the tray is pressed down slightly and then relased , it executes SHM with a time peroid of 1.5 s.The spring constant of each spring is .



A. ∞

B. $50Nm^{-1}$

C. 0

D. $105Nm^{-1}$

Answer:

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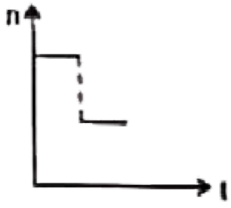
60. A train whistling at constant frequency 'n' is moving towards a station at a constant speed V. The train goes past a stationary observr on the station . The frequecy 'n' of the

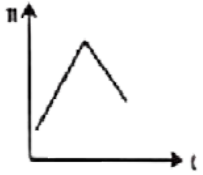
sound as heard by the observe is plotted as function of time 't' . Identify the correct curve .

A.

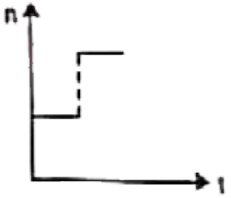


B.

C.



D.



Answer:

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61. An infinitely long the thin strainght wire has uniform charge density of $\frac{1}{4} \times 10^{-2} cm^{-1}$ what is the magnitude of elctric field at a distance $20cm$ form the axis of the wire ?

A. $9 \times 10^{8} NC^{-1}$

B. $1.12 \times 10^{8} NC^{-1}$

C. $4.5 \times 10^8 NC^{-1}$

D. $2.25 \times 10^8 NC^{-1}$

Answer:

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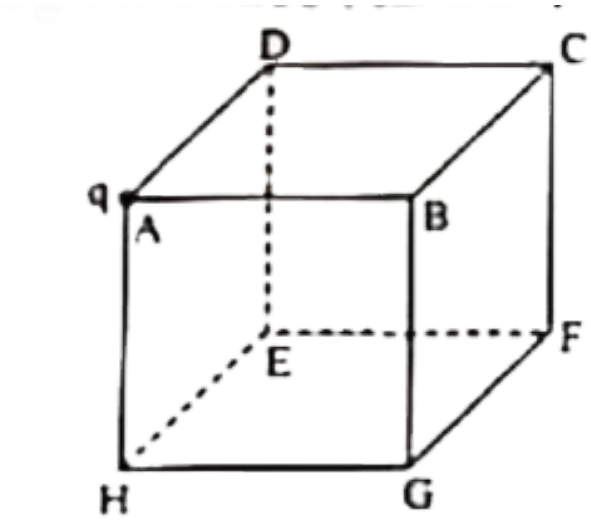
62. A point charge 'q' is palced at the corner fo cube of side of as shown in the figure . What

ist he electic flux throught the face ABCD ?



A. $\frac{q}{72\varepsilon_0}$

B. 0

C. $\frac{q}{24\varepsilon_0}$

D. $\frac{q}{6\varepsilon_0}$

Answer:

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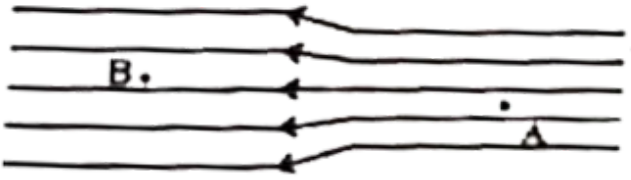
63. The electric filed lines on the left have twice the sepration on those on the right as shown in figure . If the magntiude of the filed at A is $40Vm^{-1}$ .what is the force on $20\mu C$ charge kept at B ?



A. $1 \times 10^{-4} N$

B. $4 \times 10^{-4} N$

C. $8 \times 10^{-4} N$

D. $16 \times 10^{-4} N$

Answer:

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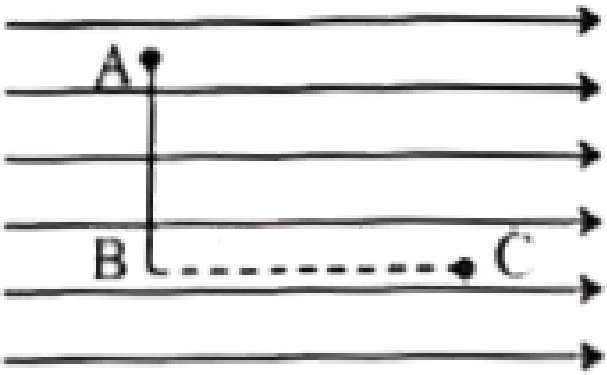
64. Figure showns three point A, B and C in a region of uniform electric field $\vec{E}$. The line AB is perpendicualr and BC is parallel to the filed

line . Then which of the following holds good ? $(V_A . V_B)$ and V_C represent the electric potential at point A, B and C respectively).



A. $V_A > V_B = V_C$

B. $V_A = V_B = V_C$

C. $V_A = V_B > V_C$

D. $V_A = V_B < V_C$

Answer:

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65. A dipole of dipole moment P and moment of inertia I is placed in an unifrom electric filed $\vec{E}$. If it is displaced slighty from its stable equilibrium position , then the period of the oscillation of dipole is .

A. $\pi\sqrt{\frac{1}{PE}}$

B. $\sqrt{\frac{PE}{I}}$

C. $2\pi\sqrt{\frac{I}{PE}}$

D. $\frac{1}{2\pi}\sqrt{\frac{PE}{I}}$

Answer:

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66. The difference between equivalent capacitances of two identical capacitors connected in parallel to that in series is $6\mu F$. The value of capacitances of each capacitior is

.

A. $6\mu F$

B. $2\mu F$

C. $3\mu F$

D. $4\mu F$

Answer: $4\mu F$

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