

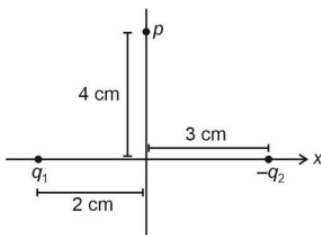
JEE Main 2024 Physics Question Paper

April 8 Shift 2

(B.E./B.Tech)

JEE Main Physics Questions

Ques 1. Figure shows two charges q_1 and $-q_2$ placed on the x-axis as shown. If electric field at p is along x-direction, find q_1/q_2



- A. $4\sqrt{5} / 25$
- B. $8\sqrt{5} / 25$
- C. $12/25$
- D. $16\sqrt{5} / 25$

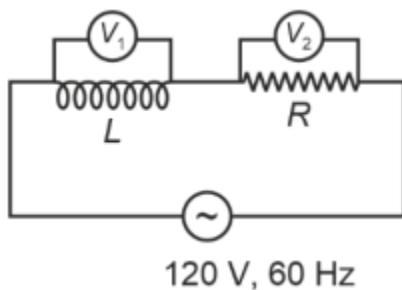
Ans. B

Ques 2. A disk of mass M , radius R is rotating about an axis passing through its centre and perpendicular to its plane with angular speed ω . If another disk of mass $M/2$ and radius R is gently placed over it what will be their common angular velocity after some time?

- A. $\omega/5$
- B. $\omega/2$
- C. $2\omega/3$
- D. $\omega/4$

Ans. C

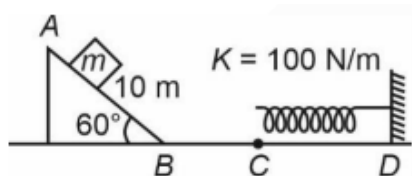
Ques 3. In a given AC circuit consisting of a resistor R and an inductor L and source emf, two voltmeter V_1 & V_2 are connected as shown. If $V_2 = 36$ volts then inductance of inductor is (Resistance R is $\sqrt{91}\Omega$.)



- A. 0.08 H
- B. 0.8 H
- C. 8 H
- D. 80 H

Ans. A

Ques 4. A block of mass 5 kg is released as shown in the figure. Surface CD is rough with $\mu = 0.5$, rest of all the surfaces are smooth. Find the maximum compression in the spring (initially spring is in its natural length.)



- A. 1.5 m
- B. 2.0 m
- C. 3.5 m
- D. 2.5 m

Ans. B

Ques 5. A physical quantity P depends on electric field (E) and permittivity of free space (ϵ_0) as $P \propto E \epsilon_0^2$, Find dimension of P

- A. $[ML^{-5}T^5]^3$
- B. $[M^{-1}L^{-5}T^5I^3]$
- C. $[M^2L^{-5}T^5I^2]$
- D. $[MLTI]$

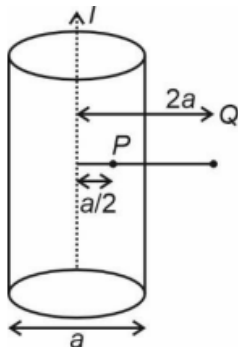
Ans. B

Ques 6. An electron and a proton has same de Broglie wavelength. If K_e and K_p are their respective kinetic energies, then

- A. $k_p > k_e$
- B. $k_p < k_e$
- C. $k_p = k_e$
- D. None of these

Ans. B

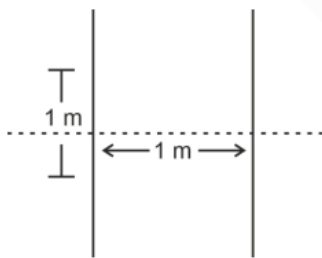
Ques 7. Find ratio of magnetic field at point P to that at point Q . Point P is inside the solid cylinder and Q is outside the cylinder. Current is uniform through the crosssection of cylinder.



- A. 2:1
- B. 1:1
- C. 1:2
- D. 4:1

Ans. B

Ques 8. In a YDSE shown a monochromatic light of wavelength 500 nm is incident. At point P, 10th maxima is formed. Now the two slits are replaced with a single slit of width w placed at the centre. If first diffraction minima is observed at P, find w .



- A. 0.5 mm
- B. 1 mm
- C. 0.1 mm
- D. 0.2 mm

Ans. C

Ques 9. An object is projected such that its horizontal range and maximum height are same, then angle of projection is

- A. $\tan^{-1}2$
- B. $\tan^{-1}1$
- C. $\tan^{-1}3$
- D. $\tan^{-1}4$

Ans. D

Ques 10. A wave is given by the equation $y = A \sin\{\pi(330t - x)\}$, then frequency of the wave is

- A. 330 Hz**
- B. 660 Hz**
- C. 165 Hz**
- D. $1/330$ Hz**

Ans. C

Ques 11. A vernier caliper having least count $1/20$ N cm and one main scale division is 1 mm, then value of one vernier scale division is

- A. $(N+1)\text{mm} / 2N$**
- B. $(2N+1)\text{mm} / 2N$**
- C. $(2N-1)\text{mm} / 2N$**
- D. $(2N+2)\text{mm} / 2N$**

Ans. C

Ques 12. A screw gauge with a pitch of 1 mm and a circular scale with 100 divisions is used to measure the thickness of the aluminium sheet. Negative zero error of 0.05 mm is there. What is the thickness of the sheet when main scale reading is 4 mm and 60th division coincides with the main scale line

- A. 10.05 mm**
- B. 10.10 mm**
- C. 10.15 mm**
- D. 10.20 mm**

Ans. A
