JEE Main 2026 April 2 Shift 1 Physics

Question Paper

Conducted by National Testing Agency (NTA)

General Instructions

(i) **Duration:** The total duration of the examination is 1 hours (60 minutes).

(ii) **Total Marks:** The complete Physics paper carries a maximum of 100 marks.

(iii) **Structure:** The paper consists of two sections:

- **Section A:** 20 Multiple Choice Questions (MCQs).
- **Section B:** 5 Numerical Value Type Questions.

(iv) **Compulsory Questions:** All 25 questions are compulsory.

(v) Each question has four options. Only **one** option is correct.

(vi) **Correct Answer:** +4 marks.

(vii) **Incorrect Answer:** −1 mark (Negative marking).

(viii) **Unanswered/Marked for Review:** 0 marks.

Physics Section - A

1. The dimensional formula of $\frac{1}{2}\epsilon_0 E^2$ (ϵ_0 = permittivity of vacuum and E = electric field) is $M^a L^b T^c$. The value of $2a - b + c =$ _____.

(A) 0

(B) 1

(C) -1

(D) 2

2. The diameter of a wire measured by a screw gauge of least count 0.001 cm is 0.08 cm. The length measured by a scale of least count 0.1 cm is 150 cm. When a weight of 100 N is applied to the wire, the extension in length is 0.5 cm, measured by a micrometer of least count 0.001 cm. The error in the measured Young's modulus is $\alpha \times 10^9$ N/m^2. The value of α is _____. (Ignore the contribution of the load to Young's modulus error calculation)

(A) 1.3

(B) 1.65

(C) 0.13

(D) 0.25

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3. The velocity of a particle is given as $\vec{v} = -x\hat{i} + 2y\hat{j} - z\hat{k}$ m/s. The magnitude of acceleration at point $(1, 2, 4)$ is _____ m/s^2.

(A) $\sqrt{6}$

(B) 9

(C) $\sqrt{33}$

(D) 0

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4. The position of an object having mass 0.1 kg as a function of time t is given as $\vec{r} = (10t^2\hat{i} + 5t^3\hat{j})$ m. At $t = 1$ s, which of the following statements are correct?

(A) The linear momentum $\vec{p} = (2\hat{i} + 1.5\hat{j})$ kg $\cdot$ m/s.

(B) The force acting on the object $\vec{F} = (2\hat{i} + 3\hat{j})$ N.

(C) The angular momentum of the object about its origin $\vec{L} = 15\hat{k}$ Js.

(D) The torque acting on the object about its origin $\vec{\tau} = 20\hat{k}$ Nm.

(A) A, B and C only

(B) B, C and D only

(C) A, C and D only

(D) A, B and D only

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5. A planet (P_1) is moving around a star of mass $2M$ in an orbit of radius R. Another planet (P_2) is moving around another star of mass $4M$ in an orbit of radius $2R$. The ratio of time periods of revolution of P_2 and P_1 is _____.

(A) 1/2

(B) 2

(C) 4

(D) 1/4

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6. A particle is rotating in a circular path and at any instant its motion can be described as $\theta = \frac{5t^4}{40} - \frac{t^3}{3}$. The angular acceleration of the particle after 10 seconds is _____ rad/s^2.

(A) 150

(B) 120

(C) 130

(D) 170

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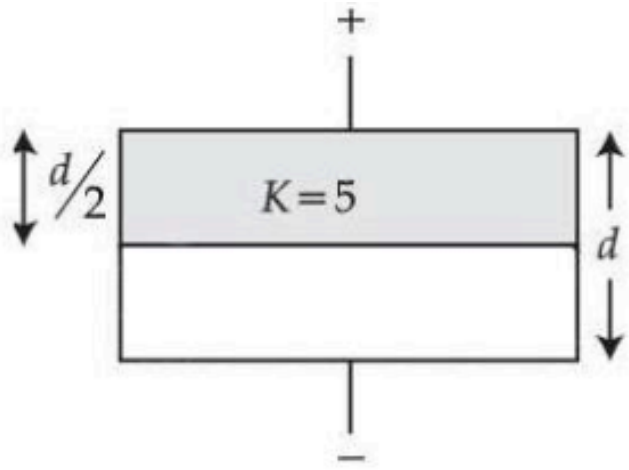
7. A parallel plate air capacitor has a capacitance C. When it is half filled as shown in figure with a dielectric constant K = 5, the percentage increase in the capacitance is _____.



(A) 33.34

(B) 66.67

(C) 200

(D) 400

8. Heat is supplied to a diatomic gas at constant pressure. Then the ratio of $\Delta Q : \Delta U : \Delta W$ is _____.

(A) 2 : 3 : 5

(B) 5 : 3 : 2

(C) 2 : 5 : 7

(D) 7 : 5 : 2

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9. Two charged conducting spheres S_1 and S_2 of radii 8 cm and 18 cm are connected to each other by a wire. After equilibrium is established, the ratio of electric fields on S_1 and S_2 spheres are E_{S1} and E_{S2} respectively. The value of $\frac{E_{S1}}{E_{S2}}$ is _____.

(A) 3 / 2

(B) 2 / 3

(C) 4 / 9

(D) 9 / 4

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10. The equation of a plane progressive wave is given by $y = 5\cos\pi\left(200t - \frac{x}{150}\right)$ where x and y are in cm and t is in second. The velocity of the wave is _____ m/s.

(A) 120

(B) 150

(C) 200

(D) 300

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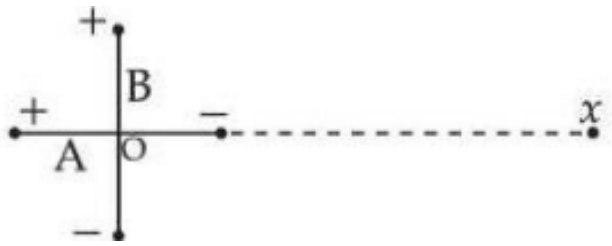
11. Two short electric dipoles A and B having dipole moment p_1 and p_2 respectively are placed with their axis mutually perpendicular as shown in the figure. The resultant electric field at a point x is making an angle of $60°$ with the line joining points O and x. The ratio of the dipole moments p_2/p_1 is :



(A) $\frac{\sqrt{3}}{2}$

(B) $2\sqrt{3}$

(C) $\frac{1}{\sqrt{3}}$

(D) $\sqrt{3}$

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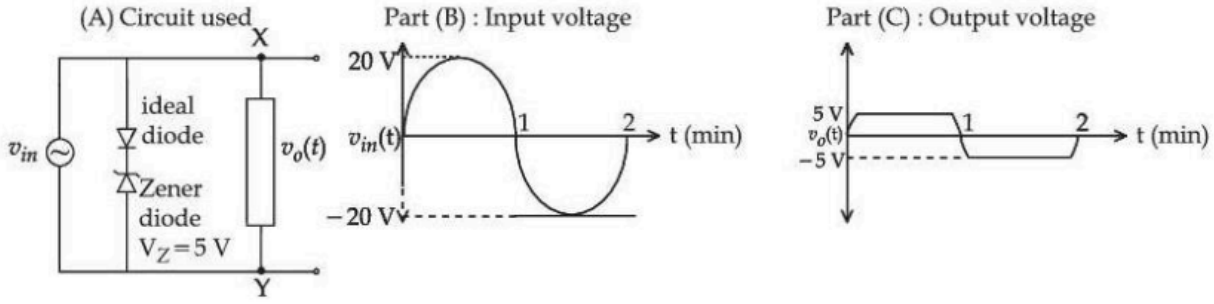
12. For the given circuit (shown in part (A)) the time dependent input voltage $v_{in}(t)$ and corresponding output $v_o(t)$ are shown in part (B) and part (C), respectively. Identify the components that are used in the circuit between points X and Y.

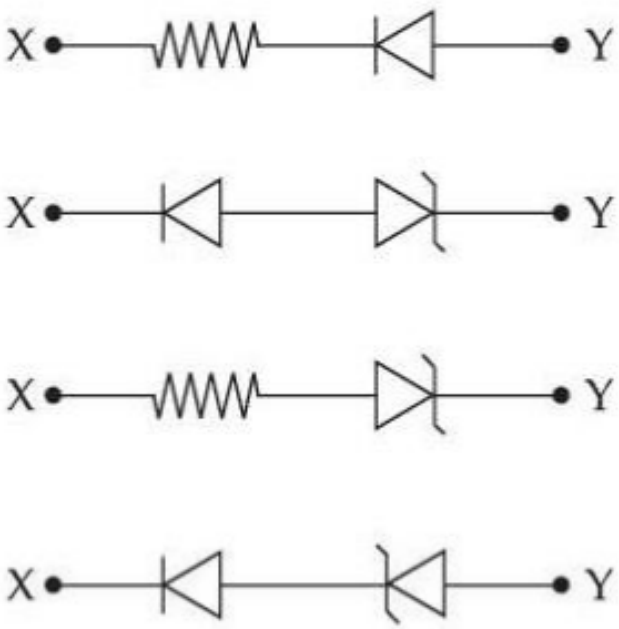


(A) Resistor and ideal diode pointing right

(B) Ideal diode (pointing right) and Zener diode (cathode left)

(C) Resistor and Zener diode (cathode right)

(D) Ideal diode (pointing left) and Zener diode (cathode left)



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13. When a coil is placed in a time dependent magnetic field the power dissipated in it is P. The number of turns, area of the coil and radius of the coil wire are N, A and r respectively. For a second coil number of turns, area of the coil and radius of the coil wire are 2N, 2A and 3r respectively. When the first coil is replaced with second coil the power dissipated in it is $\sqrt{2}\alpha P$. The value of α is _____.

(A) 36

(B) 128 $\sqrt{2}$

(C) 16

(D) 64

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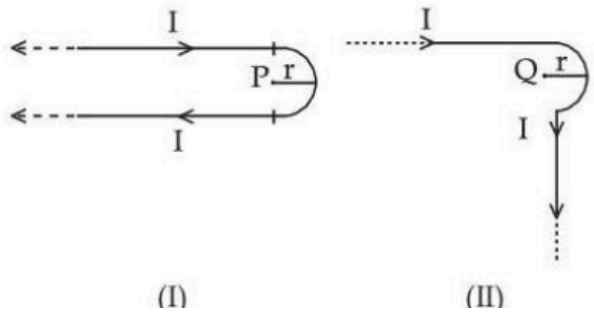
14. Two identical long current carrying wires are bent into the shapes shown in the following figures. If the magnitude of magnetic fields at the centres P and Q of a semicircular arc are B_1 and B_2 respectively, then the ratio $\frac{B_1}{B_2}$ is _____.



(A) $\frac{2+\pi}{1+\pi}$

(B) $\frac{1+\pi}{1-\pi}$

(C) $\frac{2+\pi}{1-\pi}$

(D) $\frac{1+\pi}{2-\pi}$

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15. For a thin symmetric prism made of glass (refractive index 1.5), the ratio of incident angle and minimum deviation will be _____.

(A) 3 : 4

(B) 3 : 2

(C) 2 : 1

(D) 1 : 2

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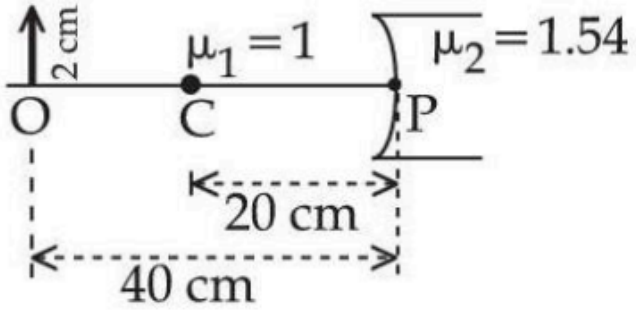
16. Refer the figure given below. μ_1 and μ_2 are refractive indices of air and lens material. The height of image will be _____ cm.



(A) 1

(B) 0.5

(C) 1.2

(D) 0.25

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17. For a certain metal, when monochromatic light of wavelength λ is incident, the stopping potential for photoelectrons is $3V_o$. When the same metal is illuminated by light of wavelength 2λ, then the stopping potential becomes V_o. The threshold wavelength for photoelectric emission for the given metal is $\alpha\lambda$. The value of α is _____.

(A) 1

(B) 4

(C) 2

(D) 3

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18. An electromagnetic wave travelling in x-direction is described by field equation $E_y = 300 \sin \omega \left(t - \frac{x}{c}\right)$. If the electron is restricted to move in y-direction only with speed of 1.5×10^6 m/s then ratio of maximum electric and magnetic forces acting on the electron is _____.

(A) 200

(B) 150

(C) 400

(D) 300

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19. Angular momentum of an electron in a hydrogen atom is $\frac{3h}{\pi}$, then the energy of the electron is _____ eV.

(A) -1.51

(B) -0.85

(C) -0.38

(D) -0.28

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20. A liquid drop of diameter 2 mm breaks into 512 droplets. The change in surface energy is $\alpha \times 10^{-6}$ J. The value of α is _____. (Take surface tension of liquid = 0.08 N/m)

(A) 10

(B) 7

(C) 8

(D) 11

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21. In single slit diffraction pattern, the wavelength of light used is 628 nm and slit width is 0.2 mm, the angular width of central maximum is $\alpha \times 10^{-2}$ degrees. The value of α is _____.

22. A vessel contains 0.15 m^3 of a gas at pressure 8 bar and temperature $140°C$ with $c_p = 3R$ and $c_v = 2R$. It is expanded adiabatically till pressure falls to 1 bar. The work done during this process is _____ kJ. (R is gas constant)

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23. $1\,\mu$C charge moving with velocity $\vec{v} = (\hat{i} - 2\hat{j} + 3\hat{k})$ m/s in the region of magnetic field $\vec{B} = (2\hat{i} + 3\hat{j} - 5\hat{k})$ T. The magnitude of force acting on it is $\sqrt{\alpha} \times 10^{-6}$ N. The value of α is _____.

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24. A uniform wire of length l of weight w is suspended from the roof with a weight of W at the other end. The stress in the wire at $\frac{l}{3}$ distance from the top is $\left(\frac{W}{A} + \frac{2}{\gamma}\frac{w}{A}\right)$, where, A is the cross sectional area of the wire. The value of γ is _____.

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25. A tub is filled with water and a wooden cube 10 cm $\times$ 10 cm $\times$ 10 cm is placed in the water. The wooden cube is found to float on the water with a part of it submerged in water. When a metal coin is placed on the wooden cube, the submerged part is increased by 3.87 cm. The mass of the metal coin is _____ gram. (Take water density as 1 g/cm^3 and density of wood as 0.4 g/cm^3)
