JEE Main 2026 April 4 Shift 2 Physics

Question Paper PDF

Conducted by National Testing Agency (NTA)

General Instructions

(i) **Duration:** The total duration of the examination is 3 hours (180 minutes).

(ii) **Total Marks:** The complete paper carries a maximum of 300 marks.

(iii) **Structure:** The paper has 3 part and each 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) **Right Answer:** +4 marks.

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

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

1. Match the LIST-I with LIST-II

List-I	List-II
A. Planck's constant	I. ML^2T^{-2}
B. Stopping potential	II. T^{-1}
C. Work function	III. ML^2T^{-1}
D. Threshold frequency	IV. $ML^2T^{-3}A^{-1}$

Choose the correct answer from the options given below:

(A) A-III, B-IV, C-I, D-II

(B) A-I, B-II, C-III, D-IV

(C) A-IV, B-III, C-I, D-II

(D) A-I, B-IV, C-III, D-II

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2. Two cars A and B are moving in the same direction along a straight line with speeds 100 km/h and 80 km/h, respectively such that car A is moving ahead of car B. A person in car B throws a stone with a speed v so that it hits the car A with a speed of 5 m/s. The value of v is _____ km/h.

(A) 18

(B) 28

(C) 38

(D) 48

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3. At $t = 0$, a body of mass 100 g starts moving under the influence of a force $(5\hat{i} + 10\hat{j})$ N. After 2 s its position is $(2x\hat{i} + 5y\hat{j})$ m. The ratio $x : y$ is_____.

(A) 1 : 2

(B) 2 : 5

(C) 5 : 2

(D) 5 : 4

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4. If x and y coordinates of a projectile as a function of time (t) are given as $24t$ and $43.6t - 4.9t^2$, respectively, then the angle (in degrees) made by the projectile with horizontal when $t = 2$ s is _____.

(A) 60

(B) 45

(C) 30

(D) 75

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5. The height in terms of radius of the earth (R), at which the acceleration due to gravity becomes $g/9$, where g is acceleration due to gravity on earth's surface, is

(A) $\sqrt{3}R$

(B) $2\sqrt{2}R$

(C) $2R$

(D) $\frac{4}{9}R$

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6. A metal string A is suspended from a rigid support and its free end is attached to a block of mass M. Second block having mass 2M is suspended at the bottom of the first block using a string B. The area of cross sections of strings A and B are same. The ratio of lengths of strings of A to B is 2 and the ratio of their Young's moduli (Y_A/Y_B) is 0.5. The ratio of elongations in A to B is _____.

(A) 1

(B) 4

(C) 8

(D) 6

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7. A water spray gun is attached to a hose of cross sectional area 30 cm^2. The gun comprises of 10 perforations each of cross sectional area of 15 mm^2. If the water flows in the hose with the speed of 50 cm/s, calculate the speed at which the water flows out from each perforation. (Neglect any edge effects)

(A) 100 m/s

(B) 10 m/s

(C) 1000 m/s

(D) 15×10^2 m/s

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8. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: If the average kinetic energy of H_2 and O_2 molecules, kept in two different sized containers are same, then their temperatures will be same.

Reason R: The r.m.s. speed of H_2 and O_2 molecules are same at same temperature.

Choose the correct answer from the options given below

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true but R is NOT the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

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9. The temperature of a metal strip having coefficient of linear expansion α is increased from T_1 to T_2 resulting in increase of its length by ΔL_1. The temperature is further increased from T_2 to T_3 such that the increase in its length is ΔL_2.
Given $T_3 + T_1 = 2T_2$ and $T_2 - T_1 = \Delta T$, the value of ΔL_2 is _____.

(A) $\Delta L_1[1 + 2\alpha^2(\Delta T)^2]$

(B) $\Delta L_1[1 + \alpha^2(\Delta T)^2]$

(C) $\Delta L_1[1 + 2\alpha\Delta T]$

(D) $\Delta L_1[1 + \alpha\Delta T]$

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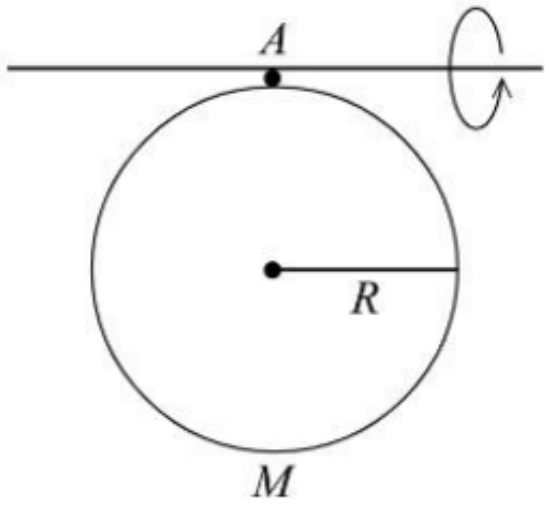
10. A uniform disc of radius R and mass M is free to oscillate about the axis A as shown in the figure. For small oscillations the time period is _____.
(g is acceleration due to gravity)



(A) $2\pi\sqrt{\frac{5R}{4g}}$

(B) $2\pi\sqrt{\frac{2R}{3g}}$

(C) $2\pi\sqrt{\frac{3R}{2g}}$

(D) $2\pi\sqrt{\frac{3R}{g}}$

11. A rigid dipole undergoes a simple harmonic motion about its centre in the presence of an electric field $\vec{E}_1 = E_0\hat{x}$. If another electric field $\vec{E}_2 = 2E_0(\hat{y} + \hat{z})$ is introduced to the system, what will be the percentage change in the frequency of the oscillation (approximate)?

(A) 73%

(B) 63%

(C) 83%

(D) 53%

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12. From the circuit given below, the capacitance between terminals A and B shown in the circuit is _____ μF.
(take $C_1 = C_2 = C_3 = 1\mu$F and $C_4 = 2\mu$F.)

(A) 2

(B) 7/2

(C) 7/3

(D) 5/2

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13. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R
Assertion A: In electrostatics, a conductor does not store any net charge inside.
Reason R: Inside the capacitor (with no dielectric medium), the free charge carriers, if placed between the plates of capacitor, experience force and drift.
Choose the correct answer from the options given below

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true but R is NOT the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

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14. A solenoid has a core made of material with relative permeability 400. The magnetic field produced in the interior of solenoid is 1.0 T. The magnetic intensity in SI units is $\alpha \times 10^5$. The

value of α is _____.

(Free space permeability $\mu_0 = 4\pi \times 10^{-7}$ SI units.)

(A) $25/\pi$

(B) $1/16\pi$

(C) $1/\pi$

(D) $1/4\pi$

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15. A magnetic field vector in an electromagnetic wave is represented by $\vec{B} = B_0 \sin\left(2\pi\nu t - \frac{2\pi x}{\lambda}\right)\hat{j}$. Its associated electric field vector is _____.

(A) $\vec{E} = -\nu\lambda B_0 \sin\left(2\pi\nu t - \frac{2\pi x}{\lambda}\right)\hat{k}$

(B) $\vec{E} = -\nu\lambda B_0 \sin\left(2\pi\nu t - \frac{2\pi x}{\lambda}\right)\hat{i}$

(C) $\vec{E} = \nu\lambda B_0 \sin\left(2\pi\nu t - \frac{2\pi x}{\lambda}\right)\hat{k}$

(D) $\vec{E} = \nu\lambda B_0 \sin\left(2\pi\nu t - \frac{2\pi x}{\lambda}\right)\hat{i}$

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16. A convex lens is made from glass material having refractive index of 1.4 with same radius of curvature on both sides. The ratio of its focal length and radius of curvature is:

(A) 0.5

(B) 2.5

(C) 0.8

(D) 1.25

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17. An unpolarized light of certain intensity passes through a combination of two polarizers whose transmission axes are at 30° and 90°, respectively, with respect to the horizontal axis. A third polarizer with its transmission axis at 60° with the horizontal axis is placed between the two existing polarizers. The ratio of the output intensities with and without the third polarizer is:

(A) 3/4

(B) 4/3

(C) 9/4

(D) 4/9

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18. In Rutherford's alpha-particle scattering experiment, only a few alpha particles rebound back because:

A. The size of gold nucleus is very small as compared to the size of gold atom.

B. Alpha particle and gold nucleus have equal charge.

C. The impact parameter is minimum for a few alpha particles.

D. A few alpha particles have very high kinetic energy.

E. Only a few alpha particles undergo head-on collision with the nuclei.

Choose the correct answer from the options given below:

(A) A, B Only

(B) B, E Only

(C) C, D Only

(D) A, C, E Only

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19. The de Broglie wavelength associated with an electron accelerated through a potential difference V is λ_e and the de Broglie wavelength associated with a proton accelerated through the same potential difference is λ_p. If their corresponding masses are m_e and m_p, respectively, then the ratio of their de Broglie wavelengths $\frac{\lambda_e}{\lambda_p}$ is:

(A) $\sqrt{\frac{m_p}{m_e}}$

(B) $\sqrt{\frac{m_e}{m_p}}$

(C) $\frac{m_p}{m_e}$

(D) $\left(\frac{m_p}{m_e}\right)^2$

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20. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: A diode under reverse-biased condition provides very small current which is nearly independent of voltage until a critical limit at which the current increases drastically.

Reason R: Below the critical voltage limit, only majority charge carriers flow which increases drastically above critical voltage.

choose the correct answer from the options given below:

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true but R is NOT the correct explanation of A

(C) A is true but R is false

(D) A is false but R is true

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21. A diode has Zener voltage of 10 V and maximum power dissipation of 0.5 W, then the minimum resistance to be used in series with this diode for safety when it is connected to a 25 V power supply is _____ Ω.

Physics Section B

22. A gun mounted on the ground fires bullets in all directions with same speed. The farthest distance the bullets could reach is 6.4 m. The speed of the bullets from the gun is _____ m/s. (take g = 10 m/s^2)

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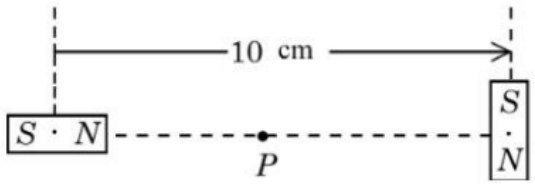
23. Two identical small bar magnets each of dipole moment $3\sqrt{5}$ J/T are placed at a center to center separation of 10 cm, with their axes perpendicular to each other as shown in figure. The value of magnetic field at the point P midway between the magnets is $\alpha \times 10^{-3}$ T. The value of α is _____. ($\mu_0 = 4\pi \times 10^{-7}$ Tm/A)



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24. A circular coil of radius 2 cm and 125 turns carries a current of 1 A. The coil is placed in a uniform magnetic field of magnitude 0.4 T. The axis of the coil makes an angle of 30° with the direction of the magnetic field. The torque acting on the coil is $\alpha \times 10^{-4}$ N.m. The value of α is

_____. ($\pi = 3.14$)

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25. In a double slit experiment, when one of the slits is covered by a transparent mica sheet of refractive index 1.56, the central fringe shifts to the position of 7^{th} bright fringe, obtained with both slits uncovered. If the light source wavelength is 450 nm, the thickness of mica sheet is $\alpha \times 10^{-9}$ m. The value of α is _____.
