JEE Main April 2026

Question Paper With Text Solution

02 April | Shift-1

PHYSICS

MATRIX

JEE Main & Advanced | XI-XII Foundation| VI-X Pre-Foundation

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JEE MAIN APRIL 2026 | 02 APRIL SHIFT-1

SECTION – A

Question ID : 69112126

26. The dimensional formula of $\frac{1}{2}\epsilon_o E^2$ (ϵ_o = permittivity of vacuum and E = electric field) is $M^aL^bT^c$.

The value of $2a-b+c=$ _____ .

(1) 0 (2) 1

(3) –1 (4) 2

Ans. (2)

Question ID : 69112127

27. 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)

(1) 1.3 (2) 1.65

(3) 0.13 (4) 0.25

Ans. (2)

Question ID : 69112128

28. 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.

(1) $\sqrt{6}$ (2) 9

(3) $\sqrt{33}$ (4) 0

Ans. (2)

Question ID : 69112129

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

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

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 $\vec{\tau} = 20\hat{k}Nm$.

Choose the correct answer from the options given below:

(1) A, B and C only
(2) B, C and D only
(3) A, C and D only
(4) A, B and D only

Ans. (4)

Question ID : 69112130

30. A planet (P_1) is moving around the star of mass 2M in the orbit of radius R. Another planet (P_2) is moving around another star of mass 4M in a orbit of radius 2R. Ratio of time periods of revolution of P_2 and P_1 is _____.

(1) $\frac{1}{2}$
(2) 2
(3) 4
(4) $\frac{1}{4}$

Ans. (2)

Question ID : 69112131

31. A particle is rotating in a circular path and at any instant its motion can be described as $\theta = \frac{5t^4}{40} - \frac{t^3}{3}$.

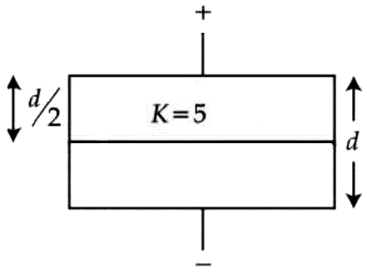
The angular acceleration of the particle after 10 seconds is _____ rad/s^2.

(1) 150
(2) 120
(3) 130
(4) 170

Ans. (3)

Question ID : 69112132

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



(1) 33.34
(2) 66.67
(3) 200
(4) 400

Ans. (2)

Question ID : 69112133

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

(1) 2 : 3 : 5
(2) 5 : 3 : 2
(3) 2 : 5 : 7
(4) 7 : 5 : 2

Ans. (4)

Question ID : 69112134

34. 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 _____ .

(1) $\frac{3}{2}$
(2) $\frac{2}{3}$
(3) $\frac{4}{9}$
(4) $\frac{9}{4}$

Ans. (4)

Question ID : 69112135

35. 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.

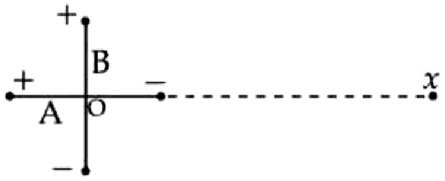
(1) 120 (2) 150

(3) 200 (4) 300

Ans. (4)

Question ID : 69112136

36. 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 _____.



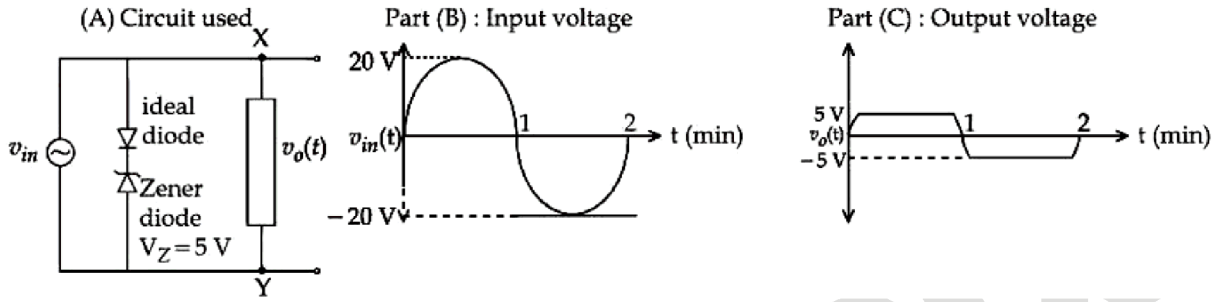
(1) $\frac{\sqrt{3}}{2}$ (2) $2\sqrt{3}$

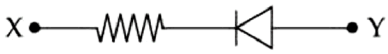
(3) $\frac{1}{\sqrt{3}}$ (4) $\sqrt{3}$

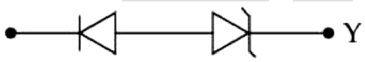
Ans. (2)

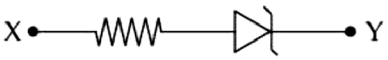
Question ID : 69112137

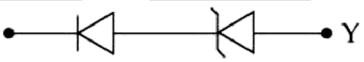
37. For the given circuit (shown in part (A)) the time dependent input voltage $v_{in}(t)$ and corresponding output $v_0(t)$ are shown in part (B) and part (C), respectively. Identify the components that are used in the circuit between points X and Y.



(1) 

(2) 

(3) 

(4) 

Ans. (2)

Sol.

Question ID : 69112138

38. 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 coils 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 _____ .

(1) 36

(2) $128\sqrt{2}$

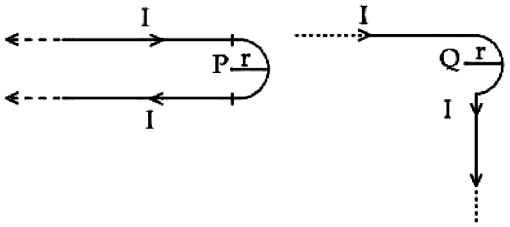
(3) 16

(4) 64

Ans. (1)

Question ID : 69112139

39. 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 _____ .



(I) (II)

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

(3) $\frac{2+\pi}{1-\pi}$ (4) $\frac{1+\pi}{2-\pi}$

Ans. (1)

Question ID : 69112140

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

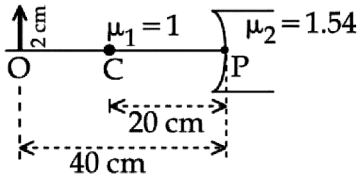
(1) 3 : 4 (2) 3 : 2

(3) 2 : 1 (4) 1 : 2

Ans. (2)

Question ID : 69112141

41. 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.



(1) 1 (2) 0.5

(3) 1.2 (4) 0.25

Ans. (1)

Question ID : 69112142

42. For a certain metal, when monochromatic light of wavelength λ is incident, the stopping potential for photoelectrons is $3V_0$. When the same metal is illuminated by light of wavelength 2λ, then the stopping potential becomes V_0. The threshold wavelength for photoelectric emission for the given metal is $\alpha\lambda$. The value of α is _____.

(1) 1 (2) 4

(3) 2 (4) 3

Ans. (2)

Question ID : 69112143

43. 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 _____ .

(1) 200 (2) 150

(3) 400 (4) 300

Ans. (1)

Question ID : 69112144

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

(1) –1.51 (2) –0.85

(3) –0.38 (4) –0.28

Ans. (3)

Question ID : 69112145

45. 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)

(1) 10 (2) 7

(3) 8 (4) 11

Ans. (2)

Question ID : 69112146

46. 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 _____ .

Ans. (36)

Question ID : 69112147

47. 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 _____k J. (R is gas constant)

Ans. (120)

Question ID : 69112148

48. $1\mu C$ 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 _____.

Ans. (171)

Question ID : 69112149

49. 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 $\frac{\ell}{3}$ 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 _____ .

Ans. (3)

Question ID : 69112150

50. A tub is filled with water and a wooden cube $10\,\text{cm} \times 10\,\text{cm} \times 10\,\text{cm}$ 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)

Ans. (387)