

JEE-Main-24-01-2025 (Memory Based)
[EVENING SHIFT]

Physics

Question: If the diameter of earth is reduced to $\frac{1}{3}$ of present diameter keeping the mass same then the ratio of new gravity to old gravity is

Options:

- (a) 9
- (b) $\frac{1}{9}$
- (c) 3
- (d) $\frac{1}{3}$

Answer: (a)

Question: A solid sphere as a hollow of identical dimensions(mass = m, Radius = R) was sliding down an inclined plane without slipping. Time taken by solid sphere = t_1 and time taken by hollow sphere = t_2 . Identify the correct relation b/w them

Options:

- (a) $t_1 > t_2$
- (b) $t_1 < t_2$
- (c) $t_1 = 2t_2$
- (d) $t_1 = t_2$

Answer: (b)

Question: A solid sphere rolls without slipping on a horizontal plane. What is ratio of translational kinetic energy to the rotational kinetic energy of the sphere.

Options:

- (a) $\frac{4}{3}$
- (b) $\frac{3}{4}$
- (c) $\frac{2}{5}$
- (d) $\frac{5}{2}$

Answer: (d)

Question: A cone is rotating about vertical axis and a mass 'm' is attached to its end. ($\omega = \frac{2}{\pi}$ rev/s). Find tension force in the mass is ' η ' ml . Find ' η '

Options:

- (a) 16
- (b) 12
- (c) 13
- (d) 11

Answer: (a)

Question: If E , p , m and c denote the energy, linear momentum, mass and speed of light, then the equation representing the correct relation could be

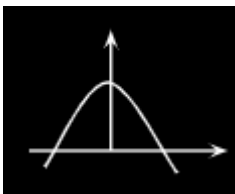
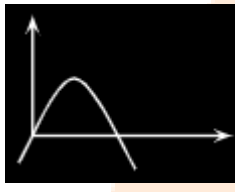
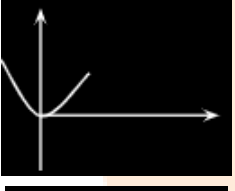
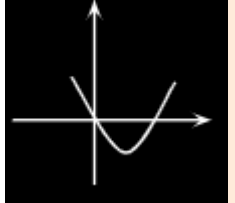
Options:

- (a) $E^2 = p^2c^2 + m^2c^4$
- (b) $E^2 = pc^2 + m^2c^4$
- (c) $E = p^2c^2 + m^2c^2$
- (d) $E^2 = pc^2 + m^2c^2$

Answer: (a)

Question: Plot the graph of k & vs displacement where $x(t) = x_0 \sin^2(e/z)$

Options:

- (a) 
- (b) 
- (c) 
- (d) 

Answer: (b)

Question: The position of a particle varies with time as $\vec{r} = (5t^2 \hat{i} - 5t \hat{j})m$.
The magnitude and direction of velocity at $t = \frac{1}{2}$ s is

Options:

- (a) $5\sqrt{2}$ m/s, -45° with +X axis
- (b) 5 m/s, -45° with +X axis
- (c) $5\sqrt{2}$ m/s, -45° with +Y axis
- (d) 5 m/s, $+45^\circ$ with +Y axis

Answer: (a)

Question: One sphere is charged with $Q = 4 \times 10^{-8}C$ and other is initially uncharged. After connecting them with wire they experience a force 9×10^{-3} N. find the distance between them. (Both are identical spheres)



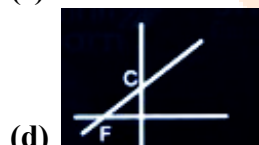
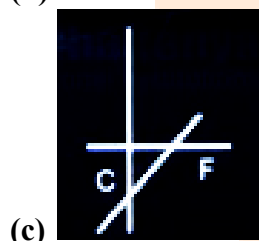
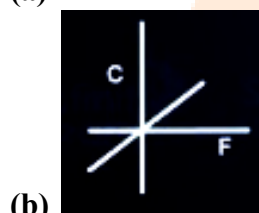
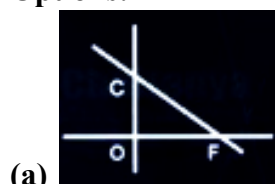
Options:

- (a) 400 m
- (b) 100 m
- (c) 250 m
- (d) 200 m

Answer: (d)

Question: Which graph shows a relation between Celsius scale & Fahrenheit scale

Options:



Answer: (c)

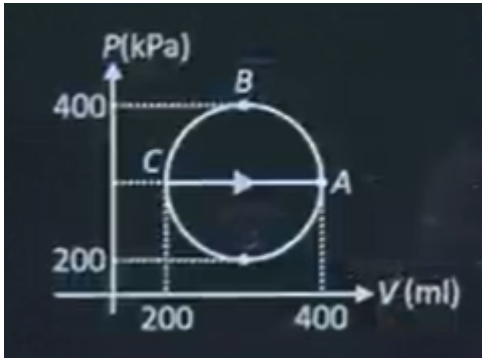
Question: Arrange the following in the correct order of wavelength ultraviolet (λ_1), x-rays (λ_2), Radio waves (λ_3), Gamma rays (λ_4)

Options:

- (a) $\lambda_4 < \lambda_2 < \lambda_1 < \lambda_3$
- (b) $\lambda_4 < \lambda_1 < \lambda_2 < \lambda_3$
- (c) $\lambda_4 < \lambda_2 < \lambda_3 < \lambda_1$
- (d) $\lambda_4 < \lambda_3 < \lambda_2 < \lambda_1$

Answer: (a)

Question: In given thermodynamic process (Circular in nature), find magnitude of work done by the gas in cycle ABCA.

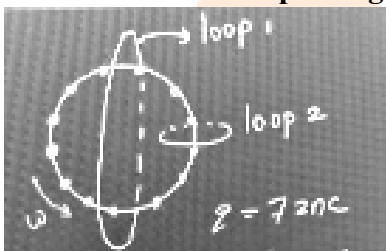


Options:

- (a) 2π
- (b) 10π
- (c) 5π
- (d) Zero

Answer: (c)

Question: Find difference in current enclosed in both loops $|i_1 - i_2|$. Loop 1 encloses entire coil and in loop 2 single segment is enclosed.

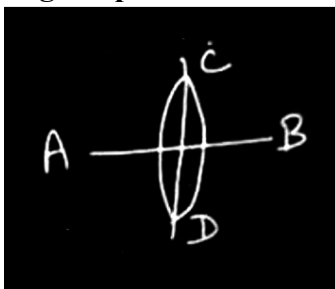


Options:

- (a) $\frac{36\omega}{2\pi} nA$
- (b) $\frac{36\omega}{\pi} nA$
- (c) $\frac{72\omega}{4\pi} nA$
- (d) $\frac{72\omega}{4\pi} mA$

Answer: (b)

Question: Thin equiconvex lens is divided into equal parts, by plane AB and CD and original power of lens is 4D find power of each piece.



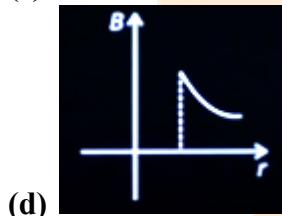
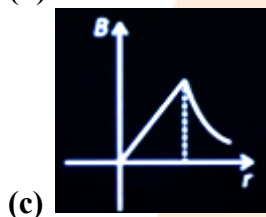
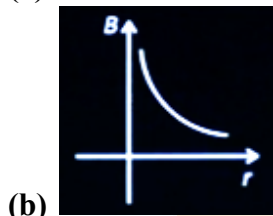
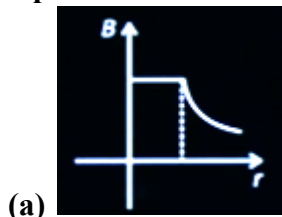
Options:

- (a) 4D

- (b) 1D
- (c) 2D
- (d) 8D

Answer: (c)

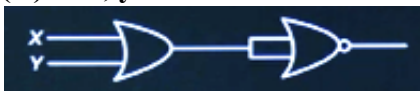
Question: There is a line solid cylinder carrying current along the axis with uniform current density. Variation of magnetic field (B) with radial distance from axis of cylinder (r) is best denoted by
Options:



Answer: (c)

Question: For which of the following input, output of the circuit is zero

- (A) $x=0, y=0$
- (B) $x=0, y=1$
- (C) $x=1, y=0$
- (D) $x=1, y=1$



Options:

- (a) A only
- (b) A, B, C only
- (c) B, C D only
- (d) A and C

Answer: (c)

Question: There is a conical pendulum of mass m and length l making 60° with vertical. Then tension in thread is

Options:

- (a) mg
- (b) $mg/2$
- (c) $2mg$
- (d) $3mg$

Answer: (c)

Question: A drone having a film of area 4 cm^2 is at a height of 18 km from ground. It covers an area of 400 km^2 on the ground. The focal length of the lens used in lens is

Options:

- (a) $18 \times 10^{-6}\text{ km}$
- (b) $18 \times 10^6\text{ km}$
- (c) $18 \times 10^3\text{ km}$
- (d) 18 km

Answer: (a)

Question: The excess pressure required to decrease the volume of water sample by 0.2% is $P \times 10^5\text{ Pa}$. If the bulk modulus of water is $1.25 \times 10^9\text{ Pa}$, then the value of P is ____.

Options:

- (a) 2.5
- (b) 25
- (c) 3.5
- (d) 35

Answer: (b)