PHYSICS

BOOKS - NTA MOCK TESTS

JEE MOCK TEST 26

Physics

1. A magnetised wire of magnetic moment $'M'$ and length $'l'$ is bent in the form of a

semicircle of radius $'r'$. The new magnetic moment is

A. $\frac{2M}{\pi}$

B. 2M

C. $\frac{M}{\pi}$

D. zero

Answer: A

Watch Video Solution

2. Two cells, having the same emf, are connected in series through an external resistance R. Cells have internal resistance r_1 and $r_2(r_1 > r_2)$ respectively. When the circuit is closed, the potential difference across the first cell is zero the value of R is

A. $\frac{r_1 + r_2}{2}$

B. $\frac{r_1 - r_2}{2}$

C. $r_1 + r_2$

D. $r_1 - r_2$

Answer: D

Watch Video Solution

3. In a magnetic field of $0.05T$, area of a coil changes from $101cm^2$ to $100cm^2$ without changing the resistance which is 2Ω. The amount of charge that flow during this period is

A. $2.5 \times 10^{-6}C$

B. $2 \times 10^{-6}C$

C. $10^{-6}C$

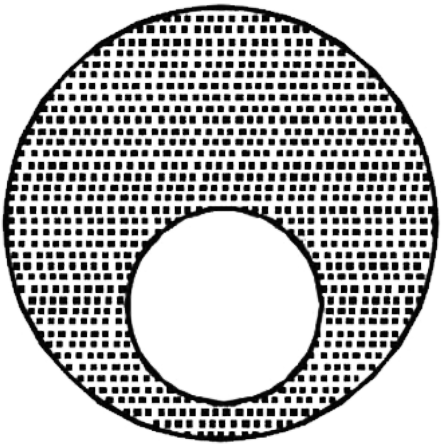
D. $8 \times 10^{-6}C$

Answer: A

Watch Video Solution

4. A spherical portion has been removed from a solid sphere having a charge distributed uniformly in its volume as shown in the figure.

The electric field inisde the emptied space is



A. zero everywhere

B. non - zero and uniform

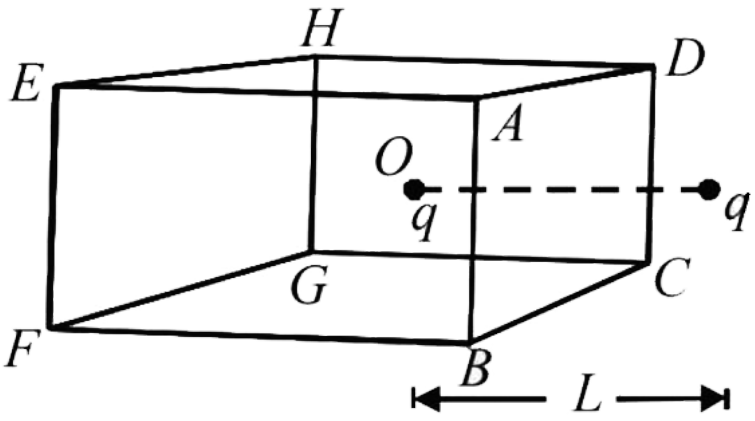
C. non - uniform

D. zero only at its centre

Answer: B

Watch Video Solution

5. A charged particle q is placed at the centre O of cube of length L(A B C D E F G H). Another same charge q is placed at a distance L from O. Then the electric flux through ABCD is



A. $\frac{q}{4\varepsilon_0}$

B. $\frac{q}{6\varepsilon_0}$

C. $\frac{q}{2\varepsilon_0}$

D. $\frac{q}{3\varepsilon_0}$

Answer: B

Watch Video Solution

6. A disc of radius R rotates with constant angular velocity ω about its own axis. Surface charge density of this disc varies as $\sigma = \alpha r^2$, where r is the distance from the centre of disc.

Determine the magnetic field intensity at the centre of disc.

A. $\mu_0 a\omega R^3$

B. $\frac{\mu_0 a\omega R^3}{6}$

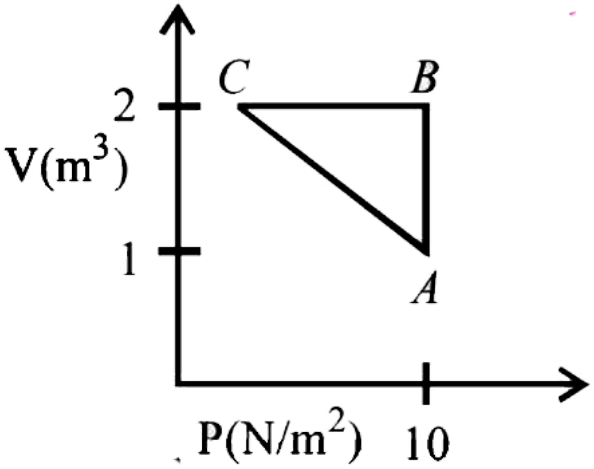
C. $\frac{\mu_0 a\omega R^3}{8}$

D. $\frac{\mu_0 a\omega R^3}{3}$

Answer: B

Watch Video Solution

7. An ideal gas is taken through the cycle $A \to B \to C \to A$, as shown in the figure, If the net heat supplied to the gas in the cycle is 5J, the work done by the gas in the process C to A is



A. $-5J$

B. $-10J$

C. $-15J$

D. $-20J$

Answer: A

Watch Video Solution

8. The displacement of particle in a medium can be expressed as $y = 10^{-6}\sin(100t - 20x + \pi/4)$m, where t is in seconds and x in meters. The speed of the wave is

A. $2000ms^{-1}$

B. $5ms^{-1}$

C. $20ms^{-1}$

D. $5\pi s^{-1}$

Answer: B

Watch Video Solution

9. The upper half of an inclined plane with inclination ϕ is perfectly smooth while the lower half is rough. A body starting from rest

at the top will again come to rest at the bottom if the coefficient of friction for the lower half is given by

A. $\tan\phi$

B. $2\tan\phi$

C. $2\cos\phi$

D. $2\sin\phi$

Answer: B

Watch Video Solution

10. Which one of the following represents the correct dimensions of the coefficient of viscosity?

A. $\left[ML^{-1}T^{-2}\right]$

B. $\left[MLT^{-1}\right]$

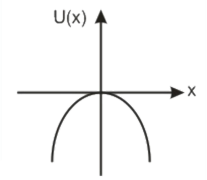
C. $\left[ML^{-1}T^{-1}\right]$

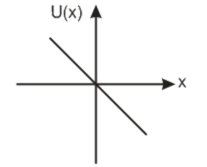
D. $\left[ML^{-2}T^{-2}\right]$

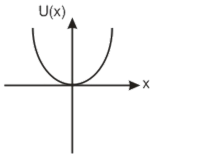
Answer: C

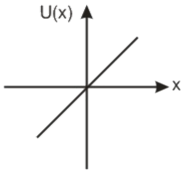
Watch Video Solution

11. A particle is placed at the origin and a force F=Kx is acting on it (where k is a positive constant). If $U_{(0)} = 0$, the graph of $U(x)$ verses x will be (where U is the potential energy function.)

A. 

B. 

C. 

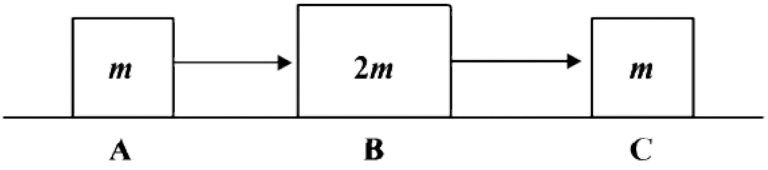
D. 

Answer: A

Watch Video Solution

12. Three object A, B and C are kept is a straight frictionless horizontal surface . These have masses m, $2m$ and m repectively . The object A move toward B with a speed $9m/s$ and makes an elastic collision with a there

after B makes complately inclesis with C . All motion over on the same straight line . Find the first speed of the object C



A. 4

B. 7

C. 10

D. 12

Answer: A

Watch Video Solution

13. A large tank filled with water to a height h is to be emptied through a small hole at the bottom. The ratio of times taken for the level of water to fall from h to $\frac{h}{2}$ and from $\frac{h}{2}$ to zero is

A. $\sqrt{2}$

B. $\frac{1}{\sqrt{2}}$

C. $\sqrt{2}-1$

D. $\frac{1}{\sqrt{2}-1}$

Answer: C

Watch Video Solution

14. A wire fixed at the upper & stretches by length l by applying a force F. What is the work done by stretching the wire ?

A. $\frac{F}{2l}$

B. FI

C. 2FI

D. $\frac{Fl}{2}$

Answer: D

Watch Video Solution

15. Which among the following has a hydrogen-like spectrum and whose lines have wavelengths four times shorter that those of atomic hydrogen?

A. Helium ion

B. Beryllium ion

C. Lithium ion

D. None of these

Answer: A

Watch Video Solution

16. Name the electromagnetic waves used for studying crystal structure of solids. What is its frequency range?

A. Microwave

B. visible radiation

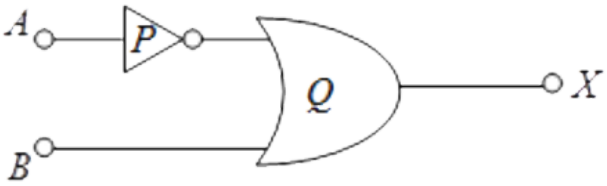
C. Ultraviolet

D. X - rays

Answer: D

Watch Video Solution

17. Write down the output at X for the inputs A = 0 , B = 0 and A = 1 , B = 1



A. x = 0 and 0

B. x = 0 and 1

C. x = 1 and 0

D. x = 1 and 1

Answer: D

Watch Video Solution

18. A battery is connected between two points A and B on the circumference of a uniform conducting ring of radius r and resistance R . One of the arcs AB of the ring subtends an angle θ at the centre . The value of the magnetic induction at the centre due to the current in the ring is

A. proportional to $(180^\circ - \theta)$

B. inversely proportional to r

C. zero , only if $(\theta = 180^\circ)$

D. zero for all values of θ

Answer: D

Watch Video Solution

19. In an experiment to determine the focal length (f) of a concave mirror by the $u - v$ method, a student places the object pin A on the principal axis at a distance x from the pole P. The student looks at the pin and its inverted image from a distance keeping his/her eye in

line with PA. When the student shifts his/her eye towards left, the image appears to the right of the object pin. Then,

A. $x < f$

B. $f < x < 2f$

C. x = 2f

D. $x > 2f$

Answer: B

Watch Video Solution

20. Yellow light is used in a single slit diffraction experiment with slit width of 0.6 mm. If yellow light is replaced by X-rays, then the observed pattern will reveal,

A. that the central maximum is narrower

B. more number of fringes

C. less number of fringes

D. no diffraction pattern

Answer: D

 Watch Video Solution

21. Two cylindrical wire A and B have the same resistance . The ratio of their specific resistances and diameters are 1 : 2 each, then what is the ratio of the length of B to the length of A ?

Watch Video Solution

22. Earth receives $1400Wm^{-2}$ of solar power. If all the solar energy falling on lens of area $0.2m^2$ is focussed on to a block of ice of mass

280 g , then what is the time (in min) taken by the ice to melt completely ? $\left[L_{\text{fusion}} = 3.3 \times 105 Jkg^{-1}\right]$

Watch Video Solution

23. Consider a pair of identical pendulums, which oscillate with equal amplitude independently such that when one pendulum is at its extreme position making an angle of 2° to the right with the vertical , the other pendulum makes an angle of 1° to the left of

the vertical. What is the phase difference between the pendulums?

Watch Video Solution

24. A metre stick is balanced on a knife edge at its centre. When two coins, each of mass $5g$ are put one on of the other at the $12cm$ mark, the stick is found to balanced at $45cm$. The mass of the metre stick is.

Watch Video Solution

25. Graviational acceleration on the surface of planet is $\frac{\sqrt{6}}{11}g$. where g is the gravitational acceleration on the surface of the earth. The average mass density of the planet is $\frac{2}{3}$ times that of the earth. If the escape speed on the surface of the earth is taken to be $11kms^{-1}$ the escape speed on the surface of the planet in kms^{-1} will be

Watch Video Solution