doubtnut
India's Number 1 Education App

PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 23

Physics

1. A person can clearly see objects between 25 cm and 200 cm. Which of the following may represent the range of clear vision for a

person B having muscles stronger than A bull all other parameters of eye identical to that of A

A. 25 cm to 200 cm

B. 18 cm to 200 cm

C. 25 cm to 300 cm

D. 18 cm to 300 cm

Answer: B

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2. In Davisson-Germer experiment, the correct relation between angle of diffraction ϕ and glancing angle θ is-

A. $\theta = 90^\circ - \frac{\phi}{2}$

B. $\phi = \frac{\theta}{2} - 90^\circ$

C. $\theta = 90^\circ - \theta$

D. $\theta = 90^\circ - \theta$

Answer: A

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3. A thin lens focal length f_1 and its aperture has diameter d. It forms an image of intensity I. Now the central part of the aperture up to diameter $\frac{d}{2}$ is blocked by an opaque paper. The focal length and image intensity will change to

A. $\frac{f}{2}, \frac{I}{2}$

B. $f, \frac{I}{4}$

C. $\frac{3f}{4}, \frac{I}{2}$

D. $f, \frac{3I}{4}$

Answer: D

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4. In a place $e.m$ wave, the electric field oscillates sinusoidally at a frequency of $2.5 \times 10^{10} Hz$ and amplitude $480 V/m$.The amplitude of oscillating magnetic field will be,

A. $1.52 \times 10^{-8} Wbm^{-2}$

B. $1.52 \times 10^{-7} Wbm^{-2}$

C. $1.6 \times 10^{-6} Wbm^{-2}$

D. $1.6 \times 10^{-76} Wbm^{-2}$

Answer: C

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5. A coil has 2000 turns and area of $70cm^2$. The magnetic field perpendicular to the plane of the coil is $0.3Wb/m^2$ and takes 0.1 sec to rotate through 180^0. The value of the induced e.m.f. will be

A. 8.4 V

B. 84 V

C. 42 V

D. 4.2 V

Answer: A

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6. Four wires of equal length and of resistance 5 ohm each are connected in the form of a square. The equivalent resistance between the diagonally opposite corners of the square is

A. 5Ω

B. 10Ω

C. 20Ω

D. $\frac{5}{4}\Omega$

Answer: A

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7. $A40\mu F$ capacitor in a defibrillator is charged to $3000V$. The energy stored in the capacitor is sent through the patient during a

pulse of duration $2ms$. The power delivered to the patient is

A. 45 kW

B. 90 kW

C. 180 kW

D. 360 kW

Answer: B

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8. A particle is moving in a force field given by potential energy $U = -\lambda(x + y + z)$from point $(1, 1, 1)$ to (2, 3, 4). The work done in the process is

A. 3λ

B. 1.5λ

C. 6λ

D. 12λ

Answer: C

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9. A particle is projected with a speed $10\sqrt{2}ms^{-1}$ and at an angle 45° with the horizontal. The rate of change of speed with respect to time at $t = 1s$ is $\left(g = 10ms^{-2}\right)$

A. $\frac{10}{\sqrt{2}}ms^{-2}$

B. $10ms^{-2}$

C. zero

D. $5ms^{-2}$

Answer: C

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10. An electric current I enters and leaves a uniform circular wire of radius a through diametrically opposite points. A charged paricle q moving along the axis of the circular wire passes through its centre at speed v. The magnetic force acting on the particle when it passes through the centre has a magnitude

A. $qv\frac{\mu_0 i}{2a}$

B. $qv\frac{\mu_0 i}{2\pi a}$

C. $qv\frac{\mu_0 i}{a}$

D. zero

Answer: D

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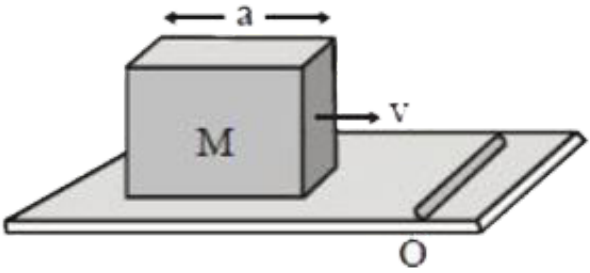
11. A cubical block of side a is moving with velocity v on a horizontal smooth plane as shown. It hits a ridge at point O. The angular

speed of the block after it hits O is:



A. $\frac{3v}{4a}$

B. $\frac{3v}{2a}$

C. $\frac{\sqrt{3}v}{\sqrt{2}a}$

D. zero

Answer: A

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12. Consider a torod , having a circular cross-section of radius b, major radius R (R > > b), having N turns and carrying current I. Find the total energy stored in the toroid.

A. $\frac{\mu_0 N^2 I^2 b^2}{2R}$

B. $\frac{\mu_0 N^2 I^2 b^2}{3R}$

C. $\frac{\mu_0 N^2 I^2 b^2}{6R}$

D. $\frac{\mu_0 N^2 I^2 b^2}{4R}$

Answer: D

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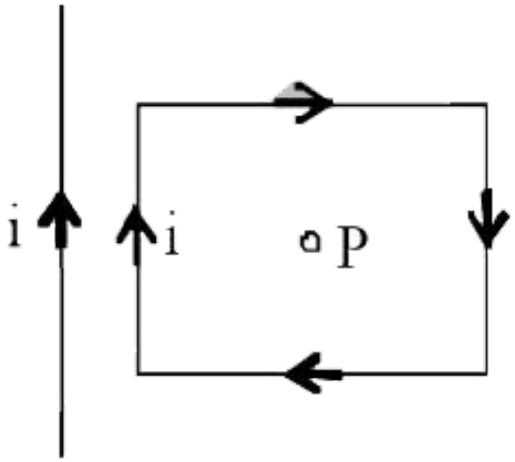
13. A wire is kept parallel to a square coil. Both carry current of same amount. If the magnetic field due to the wire at any point P with in the coil is B1, then the total magnetic in duction B

at P will be -



A. B = 0

B. $B > B_1$

C. $B < B_1$

D. $B = B_1$

Answer: B

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14. Two streams of electrons are moving parallel to each other in the same direction. They

A. a net repulsion between them

B. a net attraction between them

C. the electric repulsion and magnetic attraction nullify each other

D. the electric repulsion and magnetic repulsion nullify each other

Answer: A

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15. In the primary circuit of a potentiometer, a cell of E.M.F 1 V and a rheostat of 15Ω are connected in series. If the resistance of the potentiometer wire is 10Ω the minimum voltage at the ends of the wire (in V) will be

A. 0.1

B. 0.4

C. 0.06

D. 1.0

Answer: B

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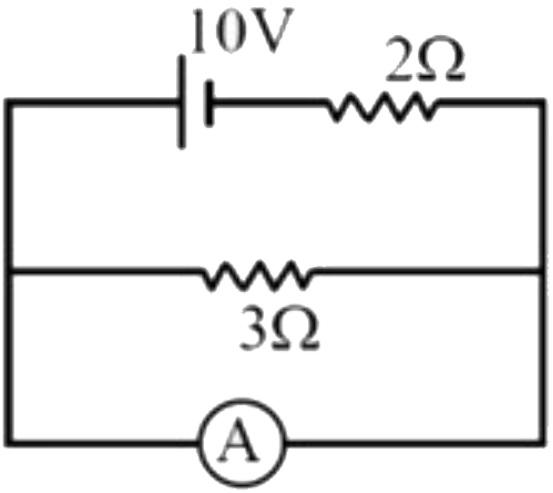
16. The reading of the ideal ammeter in the circuit is



A. $1A$

B. $2A$

C. $3A$

D. 5 A`

Answer: D

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17. The refracting angle of a prism is A, and refractive index of the material of the prism is $\cot\left(\frac{A}{2}\right)$. The angle of minimum deviation is

A. $180^\circ - A$

B. $180^\circ - 2A$

C. $90^\circ - A$

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

Answer: B

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18. The surface of a metal is illuminated with light of wavelength 400 nm. The kinetic energy of the ejected photoelectrons was found to be 1.68 eV. What is the work function of the metal ? $[hC = 1240eV \cdot nm]$

A. 3.09 eV

B. 1.41 eV

C. 1.51 eV

D. 1.68 eV

Answer: B

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19. The law of conservation of energy implies that the-

A. the total mechanical energy is conserved

B. the total kinetic energy is conserved

C. the total potential energy is conserved

D. the sum of all types of energies is conserved

Answer: D

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20. An object of mass 3 kg at rest in space suddenly explodes into three parts of the same mass. The momenta of the two parts are $4\hat{i}$ and $2\hat{j}$ respectively. Then the energy released in the explosion is

A. 60 J

B. 40 J

C. 20 J

D. 10 J

Answer: C

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21. Two charges 4q and q are placed 30 cm. apart. At what point the value of electric field will be zero

A. 10 cm away from q and between the charges

B. 20 cm away from q and between the charges

C. 20 cm away from q and outside the line joining the charges

D. 10 cm away from 4q and outside the line joining them

Answer: A

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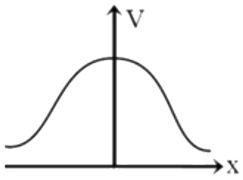
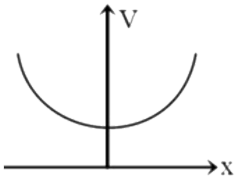
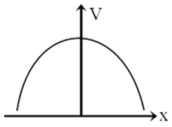
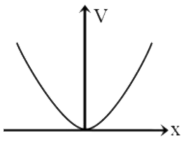
22. Two identical positive charges are placed at $x = -a$ and $x = a$. The correct variation of potential V along the x-axis is given by

A. 

B. 

C. 

D. 

Answer: A

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23. A calorimeter contains 70.2 g of water at $15.3^{\circ}C$. IF 143.7 g of water at $36.5^{\circ}C$ is mixed with it, the common temperature becomes $28.7^{\circ}C$. The water equivalent of a calorimeter is

A. 15.6 g

B. 9.4 g

C. 6.3 g

D. 13.4 g

Answer: D

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24. A vessel of volume $5000cm^3$ contains $\left(\frac{1}{20}\right)$ moles of molecular nitrogen at 1800K. If $30\,\%$ of the molecules are now dissociated the pressure inside the vessel (in Pa) will be

A. 1.49×10^5

B. 1.95×10^5

C. 2.25×10^5

D. 3.78×10^5

Answer: B

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25. A wave is represente by $y = A\sin^2(kx - \omega t + \phi)$. The amplitude and wavelength of wave is given by

A. $2A, \frac{2\pi}{k}$

B. $A, \frac{2\pi}{k}$

C. $\frac{A}{2}, \frac{2\pi}{k}$

D. $\frac{A}{2}, \frac{\pi}{k}$

Answer: D

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26. In a mixture of gases, the average number of degrees of freedom per molecule is 6. the

rms speed of the molecules of the gas is C. the velocity of sound in the gas is

A. $\frac{c}{\sqrt{2}}$

B. $\frac{3c}{4}$

C. $\frac{2c}{3}$

D. $\frac{c}{\sqrt{3}}$

Answer: C

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27. A particle is vibrating in a simple harmonic motion with an amplitude of 4 cm . At what displacement from the equilibrium position, is its energy half potential and half kinetic

A. 10 cm

B. $\sqrt{2}cm$

C. $2cm$

D. $2\sqrt{2}$ cm

Answer: D

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28. Weight of a person is 800 N. If he runs 4 m on a vertical ladder in 2s then he needs a power of

A. 3200 kW

B. 3.2 kW

C. 1.6 kW

D. zero

Answer: C

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29. A charge particle 'q' is shot towards another charged particle 'Q' which is fixed, with a speed 'v'. It approaches 'Q' upto a closest distance r and then returns. If q were given a speed of '2v' the closest distances of approach would be

A. r

B. 2r

C. $\frac{r}{2}$

D. $\frac{r}{4}$

Answer: D

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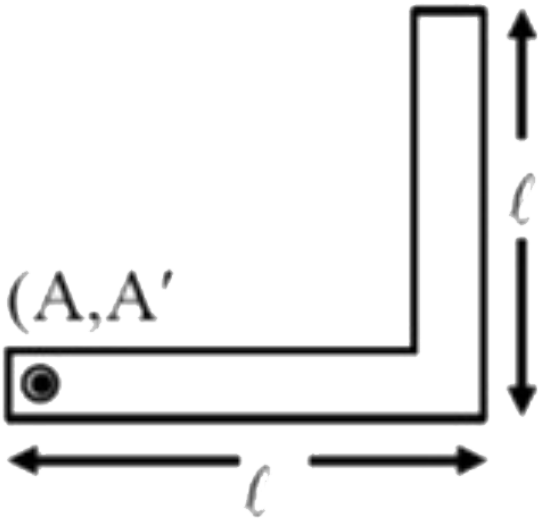
30. A L shaped rod of mass M is free to rotate in a vertical plane about axis A A as shown in

figure. Maximum angular acceleration of rod is



A. $\frac{3g}{\sqrt{10}}$

B. $\frac{9g}{101}$

C. $\frac{9g}{51}$

D. $\frac{6g}{5\sqrt{21}}$

Answer: A

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31. A nucleus of mass M emits an X-ray photon of frequency n. Energy lost by the nucleus is given as

A. hv

B. (h^2v^2)/(2MC^2)`

C. $hv\left(1-\frac{hv}{2MC^2}\right)$

D. $hv\left(1+\frac{hv}{2MC^2}\right)$

Answer: D

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32. A body of mass m collides elastically with another body at rest and then continues to move in the original continues to move in the original direction with one half of its original speed. mass of the body is

A. m

B. $\frac{2}{3}m$

C. $\frac{m}{3}$

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

Answer: C

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33. A 500 g ball is released from a height of 4m. Each time it makes contact with the ground, it loses 25% of its kinetic energy. Find the kinetic energy it possess just after the 3^{rd} hit

A. 15 J

B. 11.25 J

C. 8. 44 J

D. none of these

Answer: C

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34. A magnet is suspended horizontal in the earth's magnetic field. When it is displaced and then released it oscillates in a horizontal

plane with a period T. If a place of wood of the same moment of inertia (about the axis of rotation) as the magnet is attached to the magnet what would the new period of oscillation of the system become?

A. $\frac{T}{3}$

B. $\frac{T}{2}$

C. $\frac{T}{\sqrt{2}}$

D. $\sqrt{2}T$

Answer: D

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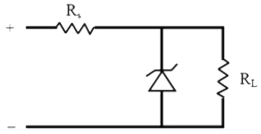
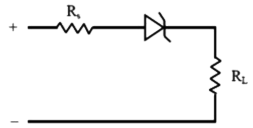
35. A zener diode is to be used as a voltage regulator. Identify the correct set up.

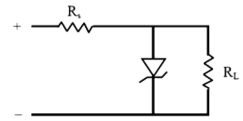
A.



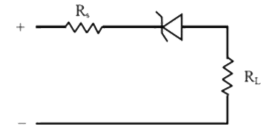
B.



C.



D.



Answer: A

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36. Depletion layer in the p-n junction consists of

A. electrons

B. holes

C. positive and negative ions fixed in their position

D. both electron and holes

Answer: C

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37. A block of mass 2 kg is having velocity $4\sqrt{5}ms^{-1}$ in the positive x - direction at the origin. The only force acting on it is $F = \left(3x^2 - 12x\right)N$. Its velocity when it is at $x = 2$ m is

A. $8ms^{-1}$

B. $4ms^{-1}$

C. $10\sqrt{24}ms^{-1}$

D. $20ms^{-1}$

Answer: A

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38. The number of nuclei of two radioactive substance is the same and their half-lives are 1 year and 2 years respectively. The ratio of their activities after 6 years will be

A. $1:4$

B. $4:1$

C. $1:8$

D. $8:1$

Answer: A

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39. When a certain metallic surface is illuminated with mono chromatic light of wavelength λ, the stopping potential for

photoelectric current is $3V_0$. When the same surface is illuminated with light of wavelength 2λ the stopping potential is V_0. The threshold wavelength for this surface for photoelectric effect is.

A. 6λ

B. 4λ

C. $\frac{4\lambda}{3}$

D. 8λ

Answer: B

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40. Two magnets, each of magnetic moment 'M' are placed so as to form a cross at right angles to each other. The magnetic moment of the system will be

A. 2 M

B. $M\sqrt{2}$

C. $\frac{M}{2}$

D. $\frac{M}{\sqrt{2}}$

Answer: B

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41. The mean time period of second's pendulum is 2.00 s and mean absolute error in the time period is 0.05s. To express maximum estimate of error, the time period should be written as

A. $(2.00 \pm 0.01)s$

B. $(2.00 \pm 0.025)s$

C. $(2.00 \pm 0.05)s$

D. $(2.00 \pm 0.10)s$

Answer: C

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42. The amount of heat (in calories) required to convert 5g of ice at $0^\circ C$ to steam at $100^\circ C$ is

$[L_{\text{fusion}} = 80 cal g^{-1}, L_{\text{vaporization}} = 540 cal g^{-1}]$

A. 3100

B. 3200

C. 3600

D. 4200

Answer: C

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43. A body is heated to a temperature $40^\circ C$ and kept in a chamber maintained at $20^\circ C$. If the temperature of the body decreases to

$36^\circ C$ in 2 minutues, then the time after which the temperature will further decrease by $4^\circ C$, is

A. 2 minutes

B. 2 minutes 33 seconds

C. 2 minutes 55 seconds

D. 3 minutues

Answer: B

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44. When a source of frequency f_0 moves away from a stationary observer with a certain velocity, an apparent frequency f' is observed. When it moves with the same speed towards the observer, the observed frequecy is $1.2f'$. If the velocity of sound is v, then the acutual frequency f_0 is

A. $\frac{12}{11}f'$

B. $\frac{11}{12}f'$

C. $\frac{7}{6}f'$

D. $\frac{6}{7}f'$

Answer: A

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45. On heating one end of a rod the temperature of the whole rod will be uniform when .

A. K = 1

B. K = 0

C. K = 100

D. $K = \infty$

Answer: D

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