PHYSICS

BOOKS - CHHAYA PHYSICS (BENGALI ENGLISH)

QUESTION PAPER OF NEET 2018

Part A

1. A wire of resistance R is stretched till its length becomes n times its original length.

What will be its new resistance?

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2. Why are electric lines of force not closed loop?

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3. The electric potential at a point (x, y, z) is given by V = $-x^2y - xz^3 + 4$. Find the intensity of electric field $\vec{E}$ at that point.

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4. Find the energy stored in the capacitor.

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5. An unpolarised light is incident at angle of polarisation on a reflector. Determine the anlge between the reflected and the transmitted rays.

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6. A person who can see objects clearly at a distance of 10 cm, requires spectacles to be able to see clearly objects at a distance of 30 cm. What typs of spectacle should he use? Find the focal length of the lens.

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7. Define stopping potential.

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8. When light of wavelengths λ and 2λ are incident on a metal surface, the stopping potentials are V_0 and $V_0/4$ respectively. If c be the velocity of light in air, find the threshold frequency of photoelectric emission.

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9. Half-life of a radioactive substacne is 30 days. Number of atoms in the substance is

10^{12}. How many disintegration of atoms per second does occur?

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10. Form And gate using NOR gates.

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11. Two cells of emf E_1, E_2 and internal resistances r_1, r_2 respectively are connected

in parallel combination.Determine the equivalent emf of the combination.

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12. Estimate the averge drift velocity of conduction electrons in a copper wire of cross section $2.0 \times 10^{-3} cm^2$ carrying a current of 2.0A. Assume the density of conduction electrons to be $9 \times 10^{28} m^{-3}$.

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13. Under what condition will the terminal potential difference be more than the emf of a cell ?

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14. The rate of heat developed in a resistor R connected to a supply of p.d. V is H. What will be the rate of heat developed if the p.d. is V/3 and the resistance doubled?

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15. Derive the expression for energy stored in an inductor of coefficient of self inductance L carrying current i_0.

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16. State the working principle of ac generator.

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17. Why is the use of ac voltage preferred over dc voltage?

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18. The power factor of a LR circuit is $\frac{1}{\sqrt{3}}$. If the frequency of ac be doubled, what will be the power factor?

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19. In Young's double slit experiment. The fringe width is 2.0 mm. Determine the separation between the 9th bright fringe and the 2nd dark fringe.

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20. Find the angular width of the central maxima of Fraunhofer diffraction pattern due to single slit.

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21. How does the angular width of the central maxima in a single slit Fraunhofer diffraction experiment change when the distance between the slit and screen is doubled?

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22. In Fraunhofer diffraction experiment, the first minima of red light (λ = 660 nm) is formed on the first maxima of another light of wavelength λ'. Find the value of λ'.

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Part B Section I

1. Select the correct answer out of the options given against each question and write in the box provided on right hand side bottom:

If V be the accelerating voltage, then the maximum frequency of X-ray emitted from an X-ray tube is

A. $\frac{eh}{V}$

B. $\frac{eV}{h}$

C. $\frac{h}{eV}$

D. none of these

Answer:

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2. Select the correct answer out of the options given against each question and write in the box provided on right hand side bottom:

The wavelength of de Broglie waves associated

with a thermal neutron of mass m at absolute temperature T is given by (k is the Boltzmann constant)

A. $\frac{h}{\sqrt{mkT}}$

B. $\frac{h}{\sqrt{2mkT}}$

C. $\frac{h}{\sqrt{3mkT}}$

D. $\frac{h}{2\sqrt{mkT}}$

Answer:

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3. Select the correct answer out of the options given against each question and write in the box provided on right hand side bottom:

Which one does not change in polarisation of light?

A. Intensity

B. Phase

C. Frequency

D. none of these

Answer:

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4. Select the correct answer out of the options given against each question and write in the box provided on right hand side bottom:

If the rotating speed of a dynamo is doubled, the induced electromotive force will be

A. doubled

B. halved

C. four times as much

D. unchanged

Answer:

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5. Select the correct answer out of the options given against each question and write in the box provided on right hand side bottom:

The number of turns of the primary and secondary of a transformer are 500 and 5000 respectively. The primary is connected to a 20 V, 50 Hz ac supply. The output of the secondary will be

A. 2 V, 50 Hz

B. 200 V, 50 Hz

C. 200 V, 5 Hz

D. 200 V, 500 Hz

Answer:

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6. Select the correct answer out of the options given against each question and write in the box provided on right hand side bottom:

An electron having charge e moves with velocity $\vec{v}$ in + x direction. An electric field acts on it along +y direction. The force on the electron acts along

A. $+z$ direction

B. $-z$ direction

C. $+y$ direction

D. $-y$ direction

Answer:

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7. Select the correct answer out of the options given against each question and write in the box provided on right hand side bottom:

Two similar bar magnets of magnetic M each are attached at right angle with each other at their ends. The magnetic moment of the system will be

A. M

B. 2 M

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

D. $\sqrt{2}M$

Answer:

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8. Select the correct answer out of the options given against each question and write in the box provided on right hand side bottom:

By how much will the power of an electric bulb decrease if the current drops by 0.5%

A. $0.25\ \%$

B. 0.5%

C. 1%

D. 2%

Answer:

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9. Select the correct answer out of the options given against each question and write in the box provided on right hand side bottom:

64 small water drops each of capacitance C

and charge q coalesce to form a larger spherical drop. The charge and capacitance of the lager drop is

A. 64q, C

B. 16q, 4C

C. 64q, 4C

D. 16q, C

Answer:

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Part B Section Ii

1. Why does a photodiode function in reverse bias?

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Questions

1. It is found that if a neutron suffers an elastic collinear collision with deuterium at rest, fractional loss of its energy is p_d, while for its

similar collision with carbon nucleus at rest, fractional loss of energy is p_c. The values of p_d and p_c are respectively

A. $0, 0$

B. 0,1

C. 0.89, 0.28

D. 0.28, 0.89

Answer:

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2. The mass of a hydrogen molecule is 3.32×10^{-27}kg. If 10^{23} hydrogen molecules strike, per second, a fixed wall of area $2cm^2$ at an angle of 45° to the normal, and rebound elastically with a speed of 10^3 m/s, then the pressure on the wall is nearly

A. $2.35 \times 10^2 \frac{N}{m^2}$

B. $4.70 \times 10^2 \frac{N}{m^2}$

C. $2.35 \times 10^3 \frac{N}{m^2}$

D. $4.70 \times 10^3 \frac{N}{m^2}$

Answer:

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3. Two batteries with emf 12 V and 13 V are connected in parallel across a load resistor of 10Ω. The internal resistances of the two batteries are $1\ \Omega$ and 2Ω respecitvely. The voltage across the load lies between

A. 11.4 V and 11.5 V

B. 11.7 V and 11.8 V

C. 11.6 V and 11.7 V

D. 11.5 V and 11.6 V

Answer:

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4. A particle is moving in a circular path of radius a under the action of an attraction potential $U = -\frac{k}{2r^2}$. Its total energy is

A. zero

B. $-\frac{3}{2}\frac{k}{a^2}$

C. $-\frac{k}{4a^2}$

D. $\frac{k}{2a^2}$

Answer:

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5. Upolarised light of intensity I passes through an ideal polariser A. Another identical polariser B is placed behind A. The intensity of light beyond B is found to be $\frac{I}{2}$. Now another

identical polariser C is placed between A and B. The intensity beyond B is now found to be $\frac{I}{8}$. The angle between polariser A and C is

A. 45°

B. 60°

C. 0°

D. 30°

Answer:

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6. An electron from various excited states of hydrogen atom emit radiation to come to the ground state. Let λ_n, λ_g be the de Broglie wavelength of the electron in the n-th state and the ground state respectively. Let Λ_n be the wavelength of the emitted photon in the transition from the n-th state to the ground state. For large n, (A, B are constants)

A. $\Lambda_n^2 \approx A + B\lambda_n^2$

B. $\Lambda_n^2 \approx \lambda$

C. $\Lambda_n \approx A + \dfrac{B}{\lambda_n^2}$

D. $\Lambda \approx A + B\lambda_n$

Answer:

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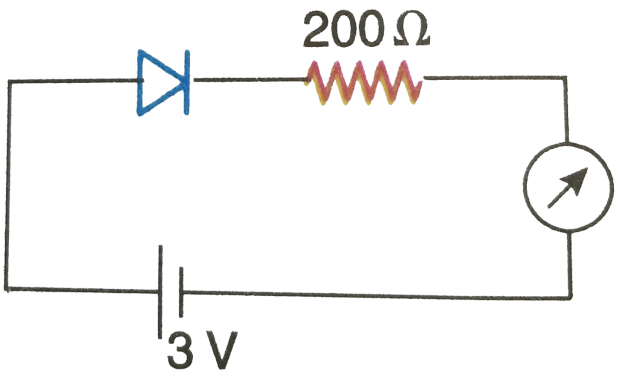
7. The reading of the ammeter for a silcon diode in the given circuit is



A. 11.5 mA

B. 13.5 mA

C. 0

D. 15 mA

Answer:

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8. An electron, a proton and an alpha particle having the same kinetic energy are moving in cirular orbits of radii r_e, r_p, r_α respectively in

a uniform magentic field B. Then relation between r_e, r_p, r_α is

A. $r_e < r_p < r_\alpha$

B. $r_e < r_\alpha < r_p$

C. $r_e > r_p = r_\alpha$

D. $r_e < r_p = r_\alpha$

Answer:

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9. A parallel plate capacitor of capacitance 90 pF is connected to a battery of emf 20 V. If a dielectric material of dielectric constant k = $\frac{5}{3}$ is inserted between the plates, the magnitude of the induced charge will be

A. 2.4 nC

B. 0.9 nC

C. 1.2 nC

D. 0.3 nC

Answer:

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10. For an RLC circuit driven with voltage of amplitude v_m and frequency $\omega_0 = \frac{1}{\sqrt{LC}}$ the current exibits resonance. The quality factor, Q is given by

A. $\frac{R}{(\omega_0 C)}$

B. $\frac{CR}{\omega_0}$

C. $\frac{\omega_0 L}{R}$

D. $\frac{\omega_0 R}{L}$

Answer:

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11. A telephonic communication service is working at carrier frequency of 10 GHz. Only 10% of it is utilized for transmission. How many telephonic channels can be transmitted simultaneously if each channel requires a bandwidth of 5 kHz?

A. 2×10^5

B. 2×10^6

C. 2×10^3

D. 2×10^4

Answer:

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12. A granite rod of 60 cm length is clamped at its middle point and is set into longitudinall vibrations. The density of granite is $2.7 \times 10^3 kg/m^3$ and its Young's modulus is

9.27×10^{10}Pa. What will be the fundamental frequency of the longitudinal vibrations?

A. 10 kHz

B. 7.5 kHz

C. 5 kHz

D. 2.5 kHz

Answer:

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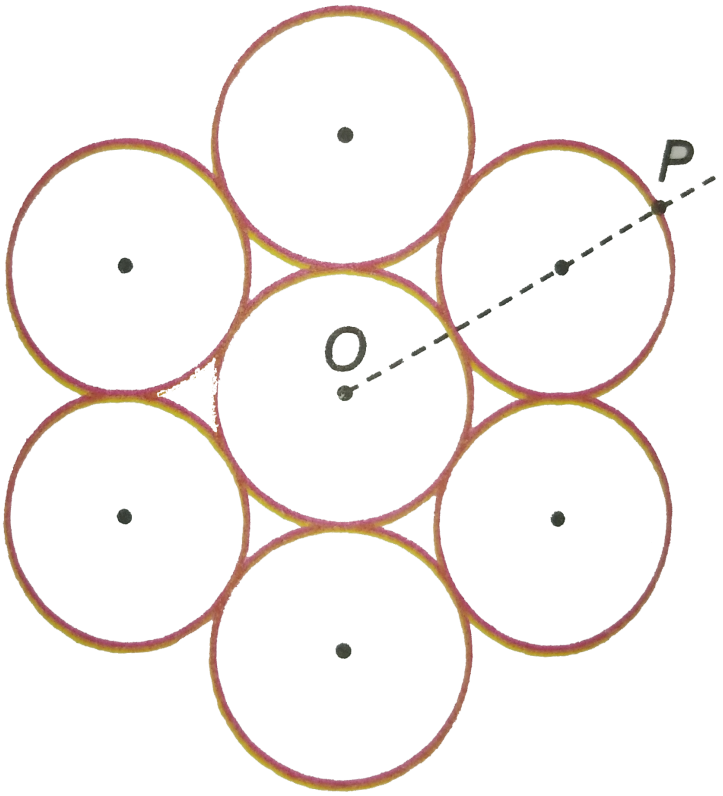
13. Seven indentical circular planar discs, each of mass M and radius R are welded symmetrically as shown, The moment of inertia of the arragement about the axis normal to the plane and passing through the

point P is



A. $\frac{73}{2}MR^2$

B. $\frac{181}{2}MR^2$

C. $\frac{19}{2}MR^2$

D. $\frac{55}{2}MR^2$

Answer:

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14. Three concentric metal shells A, B and C of respective radii a, b and c $(a < b < c)$ have surface charge densities $\sigma, -\sigma$ and $+\sigma$ respectively. The potential of shell B is

A. $\frac{\sigma}{\varepsilon_0}\left[\frac{b^2 - c^2}{b} + a\right]$

B. $\frac{\sigma}{\varepsilon_0}\left[\frac{b^2-c^2}{c}+a\right]$

C. $\frac{\sigma}{\varepsilon_0}\left[\frac{a^2-b^2}{a}+c\right]$

D. $\frac{\sigma}{\varepsilon_0}\left[\frac{a^2-b^2}{b}+c\right]$

Answer:

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15. In a potentiometer experiment, it is found that no current passes through the galvanometer when the terminals of the cell are connected across 52 cm of the

potentiometer wire. If the cell is shounted by a resistance of 5Ω, a balance is found when the cell is connected across 40 cm of the wire. Find the internal resistance of the cell.

A. 2Ω

B. 2.5Ω

C. 1Ω

D. 1.5Ω

Answer:

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16. The angular width of the central maximum in a single slit diffraction pattern is 60°. The width of the slit is 1μm. The slit is illuminated by monochromatic plane waves. If another slit of same width is made near it, Young's fringes can be observed on a screen placed at a distance 50 cm from the slits. If the observed fringe width is 1 cm, what is slit separation distance? (i.e. distance between the centres of each slit)

A. 75μm

B. 100μm

C. 25μm

D. 50μm

Answer:

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17. A silver atom in a solid oscillated in simple harmonic motion is some direction with a frequency of $10^{12}s^{-1}$. What is the force constant of the bonds connecting one atom

with the other? (mole wt. of silver = 108 and Avogadro number = $6.02 \times 10^{23} g. \mathrm{mol}^{-1}$)

A. 2.2 N/m

B. 5.5 N/m

C. 6.4 N/m

D. 7.1 N/m

Answer:

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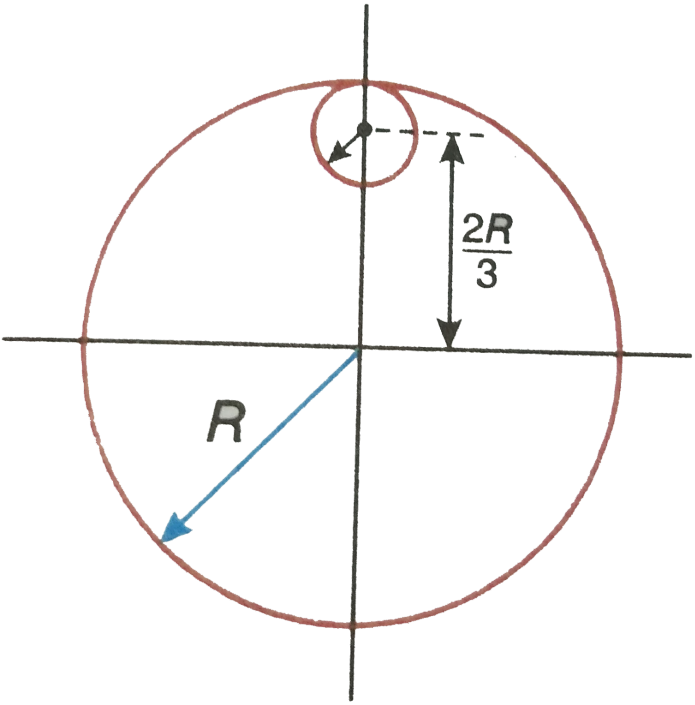
18. From a uniform circular disc of radius R and mass 9M, a small disc of radius $\frac{R}{3}$ is removed as shown in the figure. The moment of intertia of the remaining disc about an axis perpendicular to the plane of the disc and

passing through centre of the disc is



A. $10MR^2$

B. $\frac{37}{9}MR^2$

C. $4MR^2$

D. $\frac{40}{9}MR^2$

Answer:

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19. In a collinear collision, a particle with an initial speed v_0 strikes a stationary particle of the same mass. If the final total kinetic energy is $50\,\%$ greater than the original kinetic energy, the magnitude of the relative velocity between the two particles, after collision, is

A. $\frac{v_0}{2}$

B. $\frac{v_0}{\sqrt{2}}$

C. $\frac{v_0}{4}$

D. $\sqrt{2}v_0$

Answer:

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20. The dipole moment of a circular loop carrying a current I, is m and the magnetic field at the centre of the loop is B_1.When the dipole moment is doubled by keeping the

current constant, the magnetic field at the centre of the loop is B_2. The ratio B_1 / B_2 is

A. $\sqrt{2}$

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

C. 2

D. $\sqrt{3}$

Answer:

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21. The density of a material in the shape of a cube is determined by measuring three sides of the cube and its mass. If the relative errors in measuring the mass and length are respectively 1.5% and 1% , the maximum error in determining the denstiy is

A. $4.5\ \%$

B. 0.06

C. $2.5\ \%$

D. $3.5\ \%$

Answer:

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22. On interchanging the resistances, the balance point of a metre bridge shifts to the left by 10 cm. the resistance of their series combination is 1KΩ. How much was the resistance on the left slot before interchanging the resistances?

A. 550Ω

B. 910Ω

C. 990Ω

D. 505Ω

Answer:

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23. In an ac circuit, the instantaneous emf and current are given by e = 100 sin 30 t, i = 20sin $\left(30t - \frac{\pi}{4}\right)$.

In one cycle of ac, the average power

consumed by the circuit and the wattless current are, respectively

A. $\frac{50}{\sqrt{2}}$,0

B. 50,0

C. 50,10

D. $\frac{1000}{\sqrt{2}}$, 10

Answer:

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24. Two moles of an ideal monoatomic gas occupies a volume V at $27^\circ C$. The gas expands adiabatically to a volume 2V. Calculate (a) the final temperature of the gas and (b) change in its internal energy.

A. 189 K (b) -2.7 kJ

B. 195 K (b) 2.7 kJ

C. 189 K (b) 2.7 kJ

D. 195 K (b) -2.7 kJ

Answer:

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25. A particle is moving with a uniform speed in a circular orbit of radius R in a central force inversely proportional to the n th power of R. If the period of rotation of the particle is T, then

A. $T \propto R^{(n+1)/2}$

B. $T \propto R^{n/2}$

C. $T \propto R^{3/2}$ for any n

D. $T \propto R^{\frac{n}{2}+1}$

Answer:

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26. The fundamental frequency in an open organ pipe is equal to the third harmonic of a closed organ pipe.If the length of the closed organ pipe is 20 cm, the length of the open organ pipe is

A. 12.5 cm

B. 8 cm

C. 13.2 cm

D. 16 cm

Answer:

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27. At what temperature will the rms speed of oxygen molecules become just sufficient for escaping from the Earth's atmsphere? [Given, mass of oxygen molecule (m) = 2.76×10^{-26}

kg, Boltzmann's constant $k_B = 1.38 \times 10^{-23} J \cdot K^{-1}$]

A. 5.016×10^4 K

B. 8.360×10^4 K

C. 2.508×10^4 K

D. 1.254×10^4 K

Answer:

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28. The efficiency of an ideal heat engine working between the freezing point and boilling point of water, is

A. $6.25\ \%$

B. $20\ \%$

C. $26.8\ \%$

D. $12.5\ \%$

Answer:

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29. A carbon resistor of $(47 \pm 4.7)k\Omega$ is to be marked with rings of different colours for its identification. The colour code sequence will be

A. Yellow - Green - Violet - Gold

B. Yellow - Violet - Orange - Silver

C. Violet - Yellow - Orange - Silver

D. Green - Orange - Violet - Gold

Answer:

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30. A set of n equal resistors, of value R each, are connected in series to a battery of emf E and internal resistance R. The current drawn is I. Now, the n resistors are connected in parallel to the same battery. Then the current drawn from battery becomes 10I. The value of n is

A. 20

B. 11

C. 10

D. 9

Answer:

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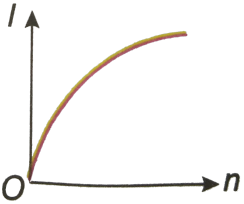
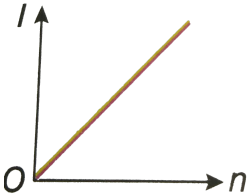
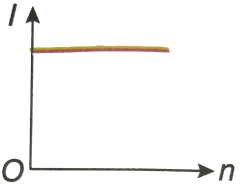
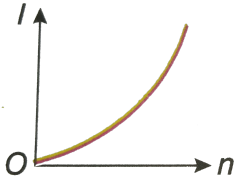
31. A battery consists of a variable number n of identical cells (having internal resistance r each) which are connected in series. The terminals of the battery are short- circuited and the current I is measured. Which of the

graphs shows the correct relationship between I and n ?

A. 

B. 

C. 

D. 

Answer:

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32. Unpolarised light is incident from air on a plane surface of a material of refractive index μ. At a particular angle of incidence i, it is found that the reflected and refracted rays are perpendicular ot each other, Which of the following options is correct for this situation?

A. $i = \sin^{-1}\left(\frac{1}{\mu}\right)$

B. Reflected light is polarised with its electric vector perpendicular to the plane of incidence

C. Reflected light is polarised with its electric vector parallel to the plane of incidence

D. $i = \tan^{-1}\left(\frac{1}{\mu}\right)$

Answer:

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33. In young's double slit experiment. The separation d between the slits is 2 mm, the wavelength λ of the light used is 5896Å and distance D between the screen and slits is 100 cm. It is found that the angular width of the fringes is 0.20°. To increase the fringe angular width to 0.21° (with same λ and D) the separation between the slits needs to be changed to

A. 2.1 mm

B. 1.9 mm

C. 1.8 mm

D. 1.7 mm

Answer:

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34. An astronomical refracting telescope will have large angular magnification and high angular resolution, when it has an objective lens of

A. large focal length and large diameter

B. large focal length and small diameter

C. small focal length and large diameter

D. small focal length and small diameter

Answer:

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35. An electron of mass m with an initial velocity $\vec{V} = V_0\hat{i}(V_0 > 0)$ enters an electric field $\vec{E} = -E_0\hat{i}(E_0 = \text{constant} > 0)$. If λ_0

is its de Broglie wavelength initially, then its de Broglie wavelength at time t is

A. λ_0 t

B. $\lambda_0\left(1+\frac{eE_0}{mV_0}t\right)$

C. $\frac{\lambda_0}{\left(1+\frac{eE_0}{mV_0}t\right)}$

D. λ_0

Answer:

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36. For a radioactive material, half-life is 10 minutes. If initially there are 600 number of nuclei, the time taken (in minutes) for the disintegration of 450 nuclei is

A. 3

B. 10

C. 20

D. 15

Answer:

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37. When the light of frequency $2v_0$ (where v_0 is threshold frequency) is incident on a metal plate, the maximum velocity of electrons emitted is v_1. When the frequency of the incident rediation is increased to $5v_0$, the maximum velocity of electrons emitted from the same plate is v_2. The ratio of v_1 to v_2 is

A. $4:1$

B. $1:4$

C. $1:2$

D. $2:1$

Answer:

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38. In a p-n junction diode, change in temperatue due to heating

A. does not affect resistance of p-n juction

B. affects only forward resistance

C. effects only reverse resistance

D. affects the overall V-I characteristics of p-n junction

Answer:

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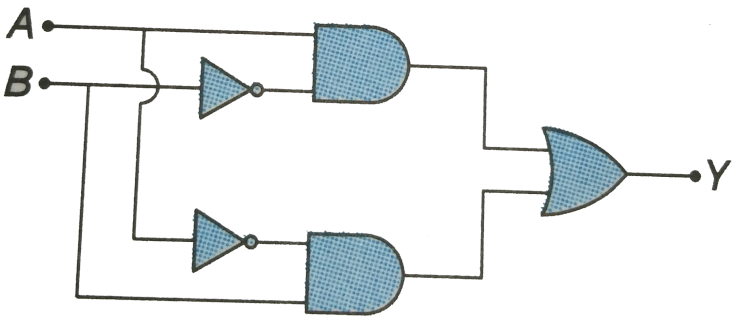
39. In the combination of the following gates the output Y can be written in terms of inputs

A and B as



A. $\overline{\overline{A} \cdot B} + A \cdot B$

B. $A \cdot \overline{B} + \overline{A} \cdot B$

C. $\overline{\overline{A} \cdot B}$

D. $\overline{\overline{A} + B}$

Answer:

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40. The refractive index of the material of a prism is $\sqrt{2}$ and the angle of the prism is 30°. One of the two refracting surfaces of the prism is made a mirror inwards, by silver coating. A beam of monochromatic light entering the prism from the other face will retrace its path (after reflection from the silvered surface) if its angle of incidence on the prism is

A. 30°

B. 45°

C. 60°

D. zero

Answer:

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41. An object is placed at a distance of 40 cm from a concave mirror of focal length 15 cm. If the object is displaced through a distance of

20 cm towards the mirror, the displacement of the image will be

A. 30 cm toward the mirror

B. 36 cm away from the mirror

C. 30 cm away from the mirror

D. 36 cm towards the mirror

Answer:

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42. The magnetic potential energy stored in a certain inductor is 25 mJ, when the current in the inductor is 60 mA. This inductor, is of inductance

A. 1.389 H

B. 138.88 H

C. 0.138 H

D. 13.89 H

Answer:

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43. An electron falls from rest through a vertical distance h in a uniform and vertically upward directed electric fiel E.The direction of electric field is now reversed, keeping its magnitude the same. A proton is allowed to fall from rest in it through the same vertical distance h. The time of fall of the electron, in comparison to the time of fall of the proton is

A. 10 times greater

B. 5 times greater

C. smaller

D. equal

Answer:

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44. The electrostatic force between the metal plates of an isolated parallel plate capacitor C having a charge Q and area A, is

A. proportional to the square root of the distance between the plates

B. linearly proportional to the distance between the plates

C. independent of the distance between the plates

D. inversely proportional to the distance between the plates

Answer:

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45. A pendulum is hung from the roof of a sufficiently high building and is moving freely to and fro like a simple harmonic oscillator. The acceleration of the bob of the pendulum is 20 m/s^2 at a distance of 5 m from the mean position. The time period of oscillation is

A. 2 s

B. πs

C. 2 πs

D. 1 s

Answer:

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46. A metallic rod of mass per unit length 0.5 $kg \cdot m^{-1}$ is lying horizontally on a smooth inclined plane which makes an angle of 30° with the horizontal. The rod is not allowed to slide down flowing a current through it when a magnetic field of induction 0.25 T is acting

on it in the vertical direction. The current flowing in the rod to keep it stationary is

A. 14.76 A

B. 5.98 A

C. 7.14 A

D. 11.32 A

Answer:

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47. An inductor 20 mH, a capacitor 100 μF and a resistor 50Ω are connected in series across a source of emf, V = 10 sin 314t. The power loss in the circuit is

A. 2.74 W

B. 0.43 W

C. 0.79 W

D. 1.13 W

Answer:

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48. Current sensitivity of a moving coil galvanometer is 5div/mA and its voltage sensitivity (angular deflection per unit voltage applied) is 20 div/V. the resistacne of the galvanometer is

A. 250 Ω

B. 25Ω

C. 40Ω

D. 500Ω

Answer:

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49. Three objects, A (a solid sphere), B (a thin circular disc) and C (a circular ring), each have the same mass M and radius R. They all spin with the same angular speed ω about their own symmetry axes. The amounts of work (W) required to bring them to rest, would satisfy the relation

A. $W_B > W_A > W_C$

B. $W_A > W_B > W_C$

C. $W_C > W_B > W_A$

D. $W_A > W_C > W_B$

Answer:

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50. A moving block having mass m, collides with another stationary block having mass 4m. The lighter block comes to rest after collision.

When the initial velocity of the lighter block is v, then the values of coefficient of restitution (e) will be

A. 0.8

B. 0.25

C. 0.5

D. 0.4

Answer:

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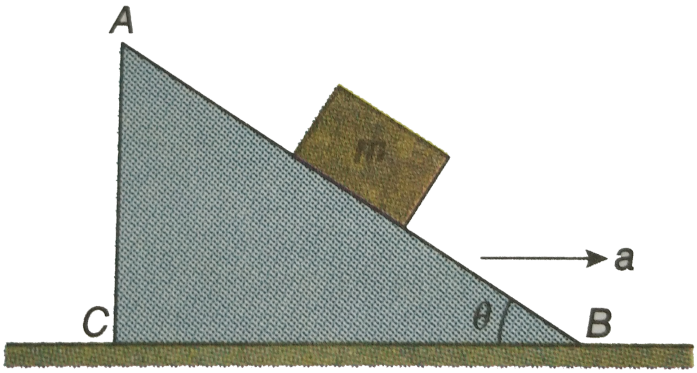
51. A block of mass m is placed on a smooth inclined wedge ABC of inclination θ as shown in the figure. The wedge is given an acceleration a towards the right. The relation between a and θ for the block to remain stationary on the wedge is



A. $a = g \cos \theta$

B. $a = \dfrac{g}{\sin \theta}$

C. a = $\frac{g}{\cos ec\theta}$

D. $a = g\tan\theta$

Answer:

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52. The moment of the force, $\vec{F} = 4\hat{i} + 5\hat{j} - 6\hat{k}$ at (2, 0, -3), about the point (2, -2, -2), is given by

A. $-7\hat{i} - 8\hat{j} - 4\hat{k}$

B. $-4\hat{i}-\hat{j}-8\hat{k}$

C. $-8\hat{i}-4\hat{j}-7\hat{k}$

D. $-7\hat{i}-4\hat{j}-8\hat{k}$

Answer:

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53. A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale reading is 5 mm and zero of circular scale division

coincides with 25 divisions above the reference level. If screw gauge has a zero error of -0.004 cm, the correct diameter of the ball is

A. 0.053 cm

B. 0.525 cm

C. 0.521 cm

D. 0.529 cm

Answer:

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54. A solid sphere is rotating freely about its symmetry axis in free space. The radius of the sphere is increased keeping its mass same. Which of the following physical quantities would remain constant for the sphere?

A. Rotational kinetic energy

B. Moment of inertia

C. Angular velocity

D. Angular momentum

Answer:

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55. If the mass of the sun were ten times smaller and the universal gravitational constant were ten times larger in magnitude, which of the following is not correct?

A. Time period of a simple pendulum on the earth would decrease

B. Walking on the ground would become more difficult

C. Raindrops will fall faster

D. g on the earth will not change

Answer:

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56. A solid sphere is in rolling motion. In rolling motion a body possesses translational kinetic energy (K_t) as well as rotational

kinetic energy (K_r) simultaneously. The ration $K_t : (K_t + K_r)$ for the sphere is

A. $10:7$

B. $5:7$

C. $7:10$

D. $2:5$

Answer:

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57. The power radiated by a black body is P and it radiates maximum energy at wavelength, λ_0. If the temperature of the black body is now changed so that it radiates maximum energy at wavelength $\frac{3}{4}\lambda_0$, the power radiated by it becomes nP. The value of n is

A. $\frac{256}{81}$

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

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

D. $\frac{81}{256}$

Answer:

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58. Two wires are made of the same material and have the same volume. The first wire cross sectional area A and the second wire has cross sectional area 3A. If the length of the first wire is increased by Δl on applying a force F, how much force is needed to stretch the second wire by the same amount?

A. 4F

B. 6F

C. 9F

D. F

Answer:

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