PHYSICS

BOOKS - AIIMS PREVIOUS YEAR PAPERS

AIIMS 2012

Physics

1. In an AC circuit, voltage V = $V_0 \sin \omega t$ and inductor L is connected across the circuit.

Then the instantaneous power will be

A. $\dfrac{V_2^2}{2\omega L}\sin\omega t$

B. $\dfrac{-V_0^2}{2\omega L}\sin\omega t$

C. $\dfrac{-V_0^2}{2\omega L}\sin 2\omega t$

D. $\dfrac{V_0^2}{\omega L}\sin 2\omega t$

Answer:

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2. Two sinusoidal waves of intensity I having same frequency and same amplitude interferes constructively at a point. The resultant intensity at a point will be

A. I

B. 2I

C. 4I

D. 8I

Answer:

3. The minimum distance between an object and its real image formed by a thin convex lens of focal length f is $K \cdot f$. Find the value of K.

A. 3F

B. 4F

C. $\dfrac{3}{2}F$

D. 2F

Answer:

4. In young's double slit experiment, fringe order is represented by m, then fringe width is

    A. Independent of m.

    B. Directly proportional to m.

    C. Directly proportional to $(2m + 1)$.

    D. Inversely proportional to $(2m + 1)$.

Answer:

5. Half life of a ratio-active element is 8 years, how much amount will be present after 32 years ?

A. $\dfrac{1}{4}$

B. $\dfrac{1}{8}$

C. $\dfrac{1}{16}$

D. $\dfrac{1}{32}$

Answer: C

6. Threshold frequency of a metal is $5 \times 10^{13} s^{-1}$ upon which $1 \times 10^{14} s^{-1}$ frequency light is focused. Then the maximum kinetic energy of emitted electron is

A. $3.3 \times 10^{-21} J$

B. $6.6 \times 10^{-21} J$

C. $3.3 \times 10^{-20} J$

D. $6.6 \times 10^{-20} J$

Answer:

7. In a given series LCR circuit

$R = 4\Omega, X_L = 5\Omega$ and $X_C = 8\Omega$, the current

A. Leads the voltage by $\tan^{-1}(3/4)$.

B. Leads the voltage by $\tan^{-1}(5/8)$.

C. Lags the voltage by $\tan^{-1}(3/4)$.

D. Lags the voltage by $\tan^{-1}(5/8)$.

Answer: C

8. A wire of mass 100 g, length 1 m and current 5 A is balanced in mid air by a magnetic field B, then find the value of B.

A. 0.2 T

B. 0.1 T

C. 0.5 T

D. 0.6 T

Answer: A

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9. Dimensional formula of ΔQ, heat supplied to the system is given by:-

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

B. $\left[M^1 L^1 T^{-2}\right]$

C. $\left[M^1L^2T^{-2}\right]$

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

Answer:

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10. A toroid with mean radius r_0, diameter $2a$ have N turns carrying current I. What is the magnetic field B inside the the toroid?

A. $\dfrac{NI}{2\pi r_0}$

B. $\dfrac{Nl}{2\pi(r_0 + a)}$

C. $\dfrac{Nl}{\pi(r_0 + a)}$

D. zero

Answer:

11. Identify incorrect for electric charge q

A. quantised

B. conserved

C. additive

D. non-transferable.

Answer:

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12. The minimum magnetic dipole moment of

electron in hydrogen atom is

A. $\dfrac{eh}{2\pi m}$

B. $\dfrac{eh}{4\pi m}$

C. $\dfrac{eh}{\pi m}$

D. 0

Answer: B

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13. A 4 kg roller is attached to a massless spring of spring constant k = 100 N/m. It rolls without slipping along a frcitionless horizontal road. The roller is displaced from its equilibrium position by 10 cm and then

released. It rolls without slipping along a frictionless horizontal road. The roller is displaced from its equilibrium position by 10 cm and then released. Its maximum speed will be

A. $0.5ms^{-1}$

B. $0.6ms^{-1}$

C. $0.4ms^{-1}$

D. $0.8ms^{-1}$

Answer:

14. Two wires carrying

A. Parallel current repel each other.

B. Antiparallel current attract each other.

C. Antiparallel current repel each other.

D. Equal magnitudes of antiparallel current

attract each other.

Answer: C

15. A particle is thrown with escape velocity v_e from the surface of earth. Calculate its velocity at height 3 R :-

A. $= 9.25 \text{ km s}^{-1}$

B. $= 5.6 \text{ km s}^{-1}$

C. $= 11.2 \text{ km s}^{-1}$

D. $= 4.3 \text{ km s}^{-1}$

Answer:

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16. What percentage of decay takes place in the average life of a substance ?

    A. Prior to alpha decay.

    B. Prior ot beta decay.

    C. Prior to positron decay.

    D. Due to de-excitment of nuclear levels.

Answer:

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17. Calculate the kinetic energy of the electron having wavelength 1 nm.

    A. 2.1 eV

    B. 3.1 eV

    C. 1.5 eV

    D. 4.2 eV

Answer:

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18. A spherical body of diameter D is falling in viscous medium. Its terminal velocity is proportional to

A. $V_t \propto D^{1/2}$

B. $V_t \propto D^{3/2}$

C. $V_t \propto D^2$

D. $V_t \propto D^{5/2}$

Answer:

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19. In case of infinite long wire electric field is proportional to

A. $\dfrac{1}{r}$

B. $\dfrac{1}{r^2}$

C. $\dfrac{1}{r^{3/5}}$

D. $\dfrac{1}{r^{3/5}}$

Answer:

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20. If 2 kg mass is rotating on a circular path of radius 0.8 m with angular velocity of 44 rad/sec. If radius of the parth becomes 1 m, then what will be the value of angular velocity?

    A. 28.16 rad/sec

    B. 19.28rad/sec

    C. 8.12 rad/sec

    D. 35.26 rad/sec

Answer:

21. Two rods of length d_1 and d_2 and coefficients of thermal conductivites K_1 and K_2 are kept touching each other. Both have the same area of cross-section. The equivalent thermal conductivity.

A. $\dfrac{(d_1 + d_2)(K_1 d_2 + K_2 d_1)}{2(K_1 + K_2)}$

B. $\dfrac{(d_1 - d_2)(K_1 d_2 + K_2 d_1)}{2(K_1 + K_2)}$
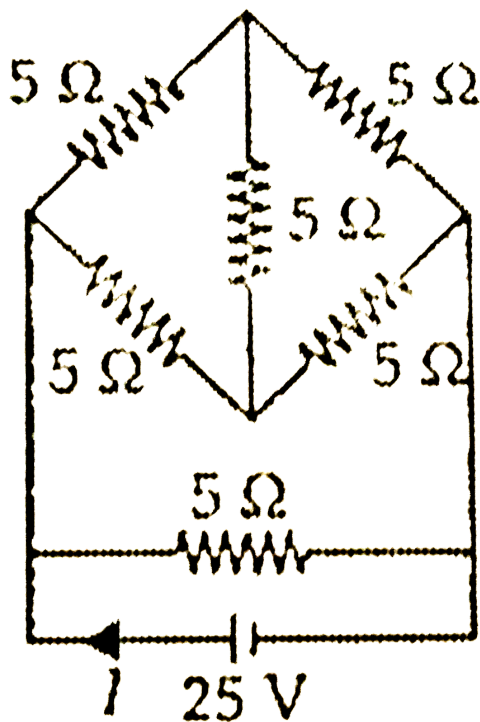
C. $\dfrac{K_1 d_1 + K_2 d_2}{d_1 + d_2}$

D. $\dfrac{K_1 + K_2}{d_1 + d_2}$

Answer:

22. Calculate I for the given circuit diagram.

A. 10A

B. 5A

C. 2.5 A

D. 20 A

Answer:

23. A solid cylinder, a circular disc, a solid sphere and a hollow cylinder of the same radius are placed on an inclined plane. Which

of the following will have maximum acceleration at the bottom of the plane?

A. Circular disc.

B. Solid cylinder.

C. Solid sphere.

D. Hollow cylinder.

Answer: C

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24. Calculate the heat emitted by a bulb of 100 W in 1 min.

    A. 100 J

    B. 1000 J

    C. 600 J

    D. 6000 J

Answer:

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25. FOR TRIATOMIC OR POLYATOMIC GASES

A. ≥ 4

B. ≥ 5

C. ≥ 6

D. ≥ 7

Answer:

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26. A particle moving about its equilibrium position with eqaution $y = -ax - bt$. Interpret the condition

A. It will always perform the SHM.

B. It can never perform the SHM.

C. It can perform SHM only when $t > \dfrac{bx}{a}$

D. It can perform SHM only when $t \leq \dfrac{bx}{a}$.

Answer:

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27. Conversion of water to steam is accompanied by which process?

A. Adiabatic

B. Isothermal

C. Isochoric.

D. Cyclic

Answer:

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28. The frequency order of for γ-rays (b) X-rays (a) UV-rays (c):

A. B gt A gt C

B. A gt B gt C

C. C gt B gt A

D. A gt C gt B

Answer:

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29. For a common - emitter transistor, input current is $5\mu A$, $\beta = 100$ circuit is operated at load resistance of $10k\Omega$, then voltage across collector emiiter will be

A. 5 V

B. 10 V

C. 12.5 V

D. 7.5 V

Answer:

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30. Assertion : Surface energy of an oil drop is same whether placed on glass or water surface.

Reason : Surface energy is dependent only on the properties of oil.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false.

Answer:

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31. Assertion : Magnetic force is always perpendicualr to the magnetic field.

Reason : Electric force is along the direction of electric field.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false.

Answer:

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32. Assertion : In elastic collision, kinetic energy is conserved.

Reason : Energy is always conserved.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false.

Answer:

33. Bohr's model failed to explain atomic spectra of multielectron atom

    A. If both assertion and reason are true and reason is the correct explanation of assertion.

    B. If both assertion and reason are true but reason is not the correct explanation of assertion.

    C. If assertion is true but reason is false

D. If both assertion and reason are false.

Answer:

34. Assertion : An electrostatic field line never

form closed loop.

Reason : Electrostatic field is a conservative

field.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false.

Answer:

35. What are the directions of electric and magnetic field vectors relative to each other and relative to the direction of propagation of electromagnetic waves ?

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false.

Answer:

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36. Why a huge amount of energy is released in nuclear fission of nuclear fusion solution.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false.

Answer:

37. Assertion : Turbulence is always dissipative.

Reason : High reynold number promotes turbulence.

    A. If both assertion and reason are true and reason is the correct explanation of assertion.

    B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false.

Answer:

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