PHYSICS

BOOKS - UNITED BOOK HOUSE

MODEL PAPER SET-15

Exercise

1. If the potential difference is increased form 10V to 20V of a capacitor of capacitance $6\mu F$, then the energy Change will.be

A. $3 \times 10^{-4} J$

B. $9 \times 10^{-4} J$

C. $12 \times 10^{-4} J$

D. $16 \times 10^{-4} J$

Answer:

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2. A Proton and an electron is projected in. a uniform magnetic Field simultaneously. Which particle will experience max Magnetic force? [Velocity = Constant]—

A. Electron

B. Proton

C. SAME in both cases

D. Can't be distinguished property,

Answer:

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3. At any place the angle of dip is 30°. If the horizontal component of earth's magnetic field is 0.5 Oe then, What Is the value of earths magnetic field at that point?—

A. 1

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

C. $\sqrt{3}$

D. $\frac{1}{\sqrt{3}}$

Answer:

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4. What is the dimension for magnetic induction Vector?—

A. $MT^{-1}C^{-1}$

B. $MT^{-2}C^{-1}$

C. $MT^{-1}C^{-1}$

D. $MT^{2}C^{-1}$

Answer:

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5. If 'n' no .of Resistance R are connected in series and then in parallel combination to get the equivalent resistance X

and Y, then what is the relation between Y, X and R-

A. $R = \sqrt{R}Y$

B. $R = Y\sqrt{X}$

C. $R = X\sqrt{Y}$

D. $\sqrt{R} = XY$

Answer:

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6. For a coil $R = 10\Omega$ and L = 10H, If it is connected with a10V battery, then what is the amount of energy stored in the system?-

A. 5J

B. 15J

C. 20J

D. 25J

Answer:

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7. For any LCR circuit, the series resonance frequency is f. If the capacitance of the circuits is increased by 4 times, then what is the resonance frequency now?—

A. $f/2$

B. 2f

C. f

D. $f/4$

Answer:

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8. If a convex mirror-is emerged in water $(\mu_w = 4/3)$, then the focal length will be

A. $3\frac{f}{2}$

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

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

D. f

Answer:

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9. At any state the total energy of $\left(H_1^1\right)$ atom is - 1.51 eV what is the no. of principle Quantum Numbers for that Shell?

A. $n = 1$

B. $n = 2$

C. $n = 3$

D. $n = 4.$

Answer:

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10. In a plane electromagnetic wave, the electric field oscillates sinusoidally at a frequency of $2.0 \times 10^{10} Hz$ and amplitude 48V/m. What is the amplitude of the oscillating magnetic field?

A. $3.2 \times 10^{7} T$

B. $3 \times 10^{7} T$

C. $16 \times 10^{-7} T$

D. $1.6 \times 10^{-7} T$

Answer:

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11. If a p-n junction diode is in reversed bias

A. No current will be obtained

B. Depletion region increases

C. Depletion region decreases

D. The height of the potential barriex increases,

Answer:

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12. UHF waveis transmitted in

A. Grand wave

B. Space wave

C. Sky wave

D. None of these

Answer:

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13. Write the expression for Lorentz force.

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14. Convert $(10101)_2$ into decimal number.

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15. Draw the symbol for two input NOR gate.

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16. Write the relation between disintegration constant and half life.

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17. Show that to get maximum power in an electrical circuit the external resistance should be equal to the internal resistance.

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18. The total number of turns for a toroid carrying current 100mA is.1500. If 10×10^{-2} m be the diameter of the toroid of length 0.5m, then find out the value of magnetic induction at the centre of the toroid.

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19. The ratio of two coils (circular) radius is $1:2$. If the magnetic moment within them are equal, then what is the ratio of their currents?

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20. Write down important properties of electromagnetic waves.

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21. Show that the energy of $\left(He_2^4\right)$ for first excited state is numerically equal to the ground state energy of Hydrogen atom..

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22. There is only one electron in H_1^1 atom but why we observe numerous number of fringes?

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23. Explain— Electric field lines cut the equipotential surface normally.

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24. An electric dipole is kept in the uniform electric field $\vec{E}$. If $\vec{p}$ be its dipole moment, then show that the torque experienced by the dipole is $\vec{\tau} = \vec{p} \times \vec{E}$.

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25. Four charges of $+2 \times 10^{-9}c, +, 1 \times 10^{-9}c, -2 \times 10^{-9}c$ and $+3 \times 10^{-9}c$

are kept at the four vertices of a square of sides $\sqrt{2}m$. What is the potential at its centre?

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26. Establish the relation between magnetic permeability and magnetic susceptibility.

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27. In a Young's double slit experiment, two wavelengths of 500nm and 700 nm were used. What is the minimum distance from the central maximum where their maxima's coincide again? (Take D/d=1000) . Symbols have their usual meanings

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28. Write down the relationship between wavelength and energy of a photon? If a proton and an alpha particle is moving with the same kinetic energy, then what is the relationbetween their de Broglie wave length?

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29. Give the definition of photoelectric threshold frequency and stopping, potential. Draw the variation of stopping potential vs. incident frequency

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30. If 15 kV is the P.D. between the cathode and target and it produces continuous' X-Ray specturm, then what is the minimum wavelength of X-Ray?

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31. What is a NAND gate?

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32. Obtain the balanced conditon of Wheatstone bridge from Kirchhoff's Law.

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33. A potential difference of 5 V is applied across a conductor of length 10 cm. If drift velocity of electrons is 0.00025 m/s, then what is the electron mobility?

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34. 5V potential difference is applied to a conductor of Length 10cm.If the drift velocity be $2.5 \times 10^{-2} c \frac{m}{s}$, then what will be its mobility?

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35. A circular disc is rotating about its natural axis with angular velocity of 10 rad/s . A second disc of same mass is joined to it coaxially. If the radius of the second disc is half

of the first one, then what is the angular velocity if they rotate together ?

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36. If $R = 25\Omega$ and inductive $reactance = 50\Omega$ in an A.C circuit, then what will be its power factor?

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37. In an LCR circuit $R = 10\Omega$, L= 50mH & C=5μF.What is the series resonance frequency, and Q factor?

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38. State the Huygens Principle for Physical Op'tics

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39. A myopic person can not see objects lying beyond 2m. What is the power of the lens required to remove this defect?

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