



PHYSICS

BOOKS - UNITED BOOK HOUSE

MODEL PAPER SET-14

Exercise

1. The inward and outward flux are ϕ_1 and ϕ_2 respectively then the charge inside the surface is:



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2. Two capacitors of capacitance C_1 and C_2 are connected in series and a voltage V is applied across them. What is the P.D. across C_1 :

A. $\frac{c_1}{c_2} V$

B. $\frac{c_2}{c_1} V$

C. $\frac{c_1}{c_1 + c_2} V$

D. $\frac{c_1 V}{c_1 + c_2}$

Answer:



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3. If \vec{j} = current density, \vec{E} = electric field and σ = conductivity, then the vector form of ohm's law is:

A. $\vec{j} = \sigma \vec{E}$

B. $\vec{j} = \frac{\vec{E}}{\sigma}$

C. $\sigma = \vec{j} \cdot \vec{E}$

D. $\sigma = \vec{j} \times \vec{E}$

Answer:



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4. A proton and α particle is projected with the same velocity within the magnetic field of intensity B . What is the ratio of their radius of curvature of path?

A. 1 : 1

B. 2 : 1

C. 1 : 2

D. 4: 1

Answer:



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5. For a long wire in the circular shape the magnetic field at the centre is B . If it is used to make n no. of turns, then what will be the magnetic field at the centre?

A. nB

B. $n^2 B$

C. B/n

D. $\frac{B}{n^2}$

Answer:



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6. The equation for ac current is

$$i = I_1 \sin wt + I_2 \cos wt .$$
 What is the value of

rms current?

A. $\frac{I_1 + I_2}{\sqrt{2}}$

B. $\frac{1}{2}(I_1 + I_2)$

C. $\left(\frac{1}{\sqrt{2}}\right) \sqrt{I_1^2 + I_2^2}$

D. $\frac{\sqrt{I_1^2 + I_2^2}}{2}$

Answer:



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7. The number of turns in primary and secondary coil of a transformer is 100

and 1000. If the input voltage is (500V, 50Hz)

then the output voltage will be:

A. 500V, 50Hz

B. 500V, 500HZ

C. 10V, 50Hz

D. 50V, 10Hz.

Answer:



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8. For which electromagnetic wave the range of wavelength is $10^{-10}m$

A. Visible light

B. I.R. light

C. U.V. light

D. x-ray

Answer:



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9. The relation between angle of the prism and refractive index of the medium is:

A. $(\mu + 1)A$

B. $(\mu - 1)A$

C. $\frac{\mu - 1}{\mu + 1}$

D. $\frac{\mu + 1}{\mu - 1}$

Answer:



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10. If U.V. light is incident on any medium then no photoelectric emission happens. Which will emerge the photoelectrons?

A. I.R

B. X-Ray

C. Microwave

D. Visible light,

Answer:



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11. The ground state energy of H_1^1 , atom is -13.6eV . What is the energy for $(He_2^4)^{2+}$ ion:

A. -40.8eV

B. -27.2eV

C. -13.6eV

D. -54.4eV

Answer:



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12. The range of suitable radio wave frequency for transmitting sky wave is—

A. 2 MHz (upto)

B. 5MHz-25MHz

C. 2MHz-50MHz

D. 2MHz -80MHz

Answer:



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13. What will happen to the energy of light when it travels from rarer to denser medium?



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14. If p type and n type crystals are touched with each other can p-n junction be made?



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15. Why do we prefer a potentiometer with longer wire?



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16. An electron is rotating with constant speed of $6 \times 10^7 \text{ m/s}$ in a constant magnetic field 6×10^{-4} . Find out the frequency and radius of its circular path.



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17. In a metal maximum magnetic permeability is 0.126 Tm/A , What will be its maximum magnetic permeability (relative) and Magnetic susceptibility?



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18. Why any object get heated easily in microwave if it has moisture in it?



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19. The electron in a hydrogen atom is in $n=2$ state. When it drops to the ground state a photon is emitted. What is the wavelength of photon?



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20. Write down two importances of modulation for signal transferring



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21. What type, of wave is used for LOS [Line of Sight Model]? What is the range of frequency for this- type of wave?



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22. A parallel plate capacitor is charged by a battery and then the battery is removed. Now a dielectric medium is put inside the region of the parallel plates. What will be the charge,

Potential Difference capacitance and energy stored in the capacitor?



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23. A 600pF Capacitor is connected with a 200V battery .After removing the battery another 300 pF capacitor is connected with 600 pF capacitance. The second-capacitor was uncharged. What will be the common potential?



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24. Obtain for the magnetic induction, vector at a point on the axis of a circular loop of radius r , at a distance x . If i be the current passing through the loop then draw the lines of the forces for the magnetic field.



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25. State the Einstein photoelectric equation.



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26. The de Broglie wavelength of a proton and an electron are same, then what is the relation between their kinetic energies?



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27. A photon and a proton have the same de – Broglie wavelength λ . Show that, the photon has energy $2mc\frac{\lambda}{h}$ times the energy of proton.



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28. What do, you mean by current density?

What is the relation between current density

$\left(\vec{j}\right)$ and conductivity(σ) ?



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29. Two cells having emf 1.5V and 2V have internal resistance 0.2Ω and 0.3Ω respectively.

What is the equivalent emf and equivalent resistance if they are connected in parallel combinations?



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30. A generator supplied power to a factory through cables of total resistance 20Ω . The potential difference at the generator is 5kV and the power output is 50kW . The potential difference of the supply mains at the factory is-

A. 5kV

B. 4.4kV

C. 4.8kV

D. 4.6kV

Answer:



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31. A 20Ω wire is used to supply current in a circuit. If 5000V be the potential difference and 50k 'W' be the power supplied, then What is the potential difference?



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32. Define Mutual inductance.



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33. The rate change of flux change inside on core of self inductance 0.5 H , is $20 \text{ A} / \text{S}$. What is the amount, of induced emf in the circuit?



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34. Draw the variation of Capacitive reactance with the change in frequency of an A.C source.



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35. A pure inductive coil is connected between the sides of an AC source. Show mathematically that the current will lag behind the AC voltage by a phase-difference of

$$\frac{\pi}{2}$$



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36. Obtain the relation between Brewster's angle and the refractive index of the denser medium.



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