PHYSICS

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MODEL PAPER SET-06

Exercise

1. The electric force on an electron is equal to its weight in an electric field of intensity E. The

charge of electron is e and mass is. m Then the value of E be—

A. $\dfrac{mg}{e}$

B. mge

C. $\dfrac{e}{mg}$

D. $\dfrac{e^2 g}{m^2}$

Answer:

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2. The force on a charge, situated on an axial point of an electric dipol is F.If the distance be doubled then force will be—
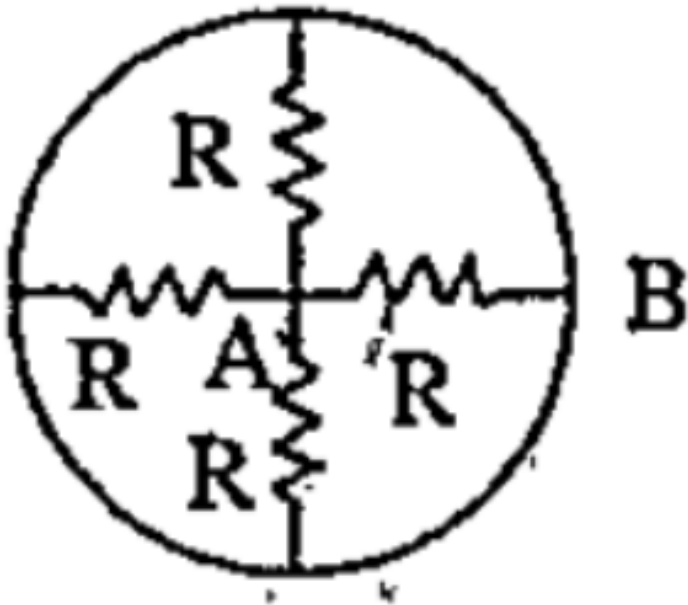
A. 2F

B. $\dfrac{F}{4}$

C. $\dfrac{F}{8}$

D. $\dfrac{F}{2}$

Answer:

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3. What is the equivalent resistance between A

and B for the given-circuit—

A. R

B. $\dfrac{R}{2}$

C. $\dfrac{R}{4}$

D. 4R

Answer:

4. A circular wire of radius r and with a constant current I is placed in a magnetic field $\overrightarrow{B}$ such that the direction of B is perpendicular to the plane of the wire. The value of the magnetic force on the circular wire—

A. BIR

B. zero

C. $\pi r I B$

D. $2\pi r I B$

Answer:

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5. What is the unit of magnetic permeability?

A. $Wb. A^{-1}m^{-1}$

B. $H.m^{-1}$

C. $T.m.A^{-1}$

D. $A.m^{-1}$

Answer:

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6. A circular metalic disc of radius a is rotating

with a uniform angular velocity (w)

perpendicularly to the uniform magnetic field

$\overrightarrow{B}$. The potential difference between the centre and the rim of the disc is—

A. $\dfrac{w^2 B a^2}{2}$

B. $\dfrac{w^2 B a}{2}$

C. $\dfrac{w B a^2}{2}$

D. $\dfrac{w B}{2a^2}$

Answer:

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7. An a.c. current I= $i_1 \sin \omega t + i_2 \sin \omega t$. The r.m.s. value of the current will be—

A. $(i_1 + i_2) / \sqrt{2}$

B. $\sqrt{\{(i_1^2 + i_2^2) / \sqrt{2}\}}$

C. $\dfrac{i_1 + i_2}{\sqrt{2}}$

D. $\sqrt{\dfrac{(i_1^2 + i_2^2)}{2}}$

Answer:

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8. A plane electromagnetic waveis propagating towards z-axis.The electric field component is along $\left(\hat{i} + \hat{j} \right)$. The magnetic component will be along—

A. A. $\left(-\hat{i} + \hat{j} \right)$

B. B. $\left(\hat{i} - \hat{j} \right)$

C. C. $\left(-\hat{i} - \hat{j} \right)$

D. D. $\left(\hat{i} + \hat{k} \right)$

Answer:

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9. The radius of curvature of an equiconcave lens (n = 1.5.) is 50 cm. The power of lens—

A. $+1.0D$

B. $+2.0D$

C. $-1.0D$

D. $-2.0D$

Answer:

10. The angle of prism is A and refractive index is cot $\dfrac{A}{2}$. The minimum deviation of the prism —

A. $180^\circ - 3A$

B. $180^\circ + 2A$

C. $90^\circ - A$

D. $180^\circ - 2A$

Answer:

11. Total energy of an electron in a ground state of hydrogen atom will be—

A. 13.6 eV

B. $-13.6eV$

C. zero

D. $-13.6J$

Answer:

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12. The impurity atom when added to germanium makes it an n-type semiconductor is

A. Indium

B. Al

C. As

D. Iodine

Answer:

13. Digital signal—

A. represent values as discrete steps

B. Do not represent values as discrete steps

C. represent random steps

D. represent- vague steps

Answer:

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14. Is neutron accelarated in a cyclotron?

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15. What is choke?

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16. What will be the change in focal length f of a concave mirror when immerged in a liquid of refractive index n?

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17. Draw i—D graph for prism, i = incident angle and D = angle of deviation.

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18. The number of negative charge carrier in an intrinsic semiconductor is n. What is -the number of positive charge carrier of it?

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19. Is the filament of "240 V— 1000 W" bulb thicker or thinner than the filament of "240 V — 100 W" bulb? why?

20. Let a uniform magentic field'is active within a finite region. A charged particle is entered into the magnetic field. Can the magnetic force on that charge particle confined it into'that region of magnetic field?

21. The current through a circular conducting coil be doubled and the radius be halved then what change of magnetic field takes place in the centre of the coil?

22. The frequency of an electromagnetic wave is 5×10^{19} Hz. What will be its wavelength? Give uses of this wave.

23. Explain about Carbon dating.

24. Electric field intensity is zero at a point. Is electric potential exist at the point?

25. Find the expression of potential energy of a charge conductor.

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26. A thin metalic sheet is placed at .the mid position between the parallel-plates of a parallel plate capacitor. What is the effect on the capacitance of the capacitor?

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27. A sensitive electric instrument is influenced by the strong electric field. Write a possible way to prevent this effect.

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28. An α particle and a proton particle are moving on the surface of a-paper. A uniform magnetic field is normal on the paper. If the linear momentum of those two particles.are same then what will be the ratio of radii of them?

29. What is optical fibre? An object is placed at a depth 'd' in a medium of-refractive index μ Show that the radius of the circular base of light cone r = $\dfrac{d}{\sqrt{\mu^2 - 1}}$

30. A glass prism is diped into a liquid of refractive index greater than 1. What should

be the change of minimum deviation?

31. What should be the change of angular width of central maximum in a single slit diffraction pattern when Width of the slit is decreased.

32. What should be the change of angular width of central maximum in a single slit diffraction pattern when distance between slit and screen is increased

33. What should be the change of angular width of central maximum in a single slit diffraction pattern when visible light of lower

wavelength is used. Give explanation for each case.

34. The velocity of an electron is v and that of another particle is 3v. The ratio of de-Broglie wavelength is 1.813×10^{-4}. What is the name of another particle either proton or α-particle?' Give reason.

35. Write down the Einstein's equation in photoelectric effect. Explain the characteristics of photoelectric effect with the aid of quantum theory of Einstein.

36. 'The energy of x-Ray is greater than visible light'— explain.

37. What is the name of the reverse process of X-ray production?

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38. Draw a circuit diagram of full wave rectifier using p-n Junction. diode. Also draw the input and output wave from.

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39. Draw a circuit diagram of OR gate using p-n junction diode. Give truth table for this gate.

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40. Compare the properties of conductor, semiconductor and insulator in the light of band theory

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41. An amount of water in an electric kettle reaches at its boiling point within 10 min. The same amount of water have to boil within 5min. Without changing heating coil and source To do this possible what should be the change of it?

42. In a potentiometer experiment the null point is obtained at 5.20 m for a cell. A Shunt

resistance of 5Ω is added. The new null point

is at 4:00 m. What is the internal resistance of

the cell ?

43. In a circuit an e.m.f. E = E_0 sin wt and

current I = I_0 sin + $\left(wt + \dfrac{\pi}{6} \right)$ Find the power

of the circuit, in a fullcycle. Draw a phasor

diagram for this voltage and the current.

Which two components may be possible in

this circuit?

44. Show that the minimum distance between the object and the screen is 4 times of focal length of a convex lens at the time of real image formation.

45. An object is placed in front of a convex lens at a distance twice of focal length.A concave mirror is on the other side of the lens. The

distance between lens and mirror is twice of the sum of their focal length.Find image distance, nature of image and the magnification.