PHYSICS

BOOKS - UNITED BOOK HOUSE

MODEL PAPER SET-02

Exercise

1. Number of electrons in 1 μC charge -

A. 1.6×10^{13}

B. 6.25×10^{12}

C. 3.2×10^{12}

D. 12.5×10^{12}

Answer:

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2. The electric potential at an axial point of an electric dipole depends upon the distance r(>>a) of the point from the centre of the dipole as

A. $\propto r$

B. $\propto \frac{1}{r}$

C. $\propto \frac{1}{r^2}$

D. $\propto \frac{1}{r^3}$

Answer:

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3. An electric bulb is designed to draw power P_0 If the voltage is V_0 IT draws a power P when voltage is V. Then P is -

A. $P = \frac{V_0 V}{P_0}$

B. $P = \frac{V_0}{V} P_0$

C. $P = \frac{(V_0)(V)}{\hat{}} 2P_0$

D. $P = \frac{(V_0)(V)}{\hat{}} 2P_0$

Answer:

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4. A long solenoid carrying a current produces a magnetic field B along its axis. IF the current is doubled and the number of turns per unit

length is halved, the new value of he magnetic field is-

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

B. B

C. 2B

D. 4B

Answer:

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5. A field line is shown in the figure 6.15. This field connot represent-

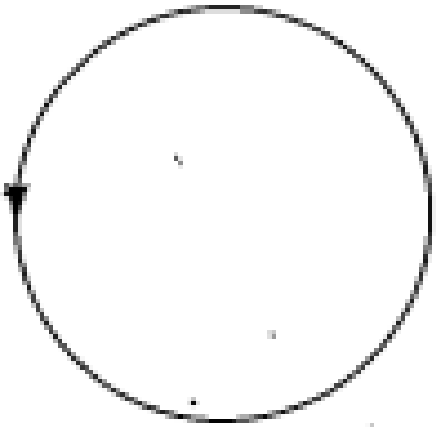

Fig. 6.15

A. magnetic field

B. electrostatic field

C. induced elctric field

D. gravitational field.

Answer:

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6. Eddy currents are-

A. induced curernt due to a changing magnetic flux

B. induced cukrrents due to a high magnetic flux

C. induced currents in a inhomogeneous material

D. Unstable currents in a conductor.

Answer:

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7. Through a capacitor

A. A.C. can pass, but D.C. cannot

B. D.C. cann pass, but A.C. cannot

C. Both A.C. and D.C. can pass

D. Both A.C. and D.C. cannot pass

Answer:

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8. According to Maxwell's theory the velocity of light in any medium-

A. $\frac{1}{\sqrt{\mu \in}}$

B. $\frac{1}{\sqrt{\mu_0 \in_0}}$

C. $\frac{1}{\sqrt{\mu} \in}$

D. $\left(\sqrt{\mu}_0 \in_0\right)$

Answer:

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9. Two sources are to be coherent if the waves originated from them are of equal-

A. Amplitude

B. Wavelength

C. Wavelength an certain phase difference

D. Amplitude and equal wavelength.

Answer:

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10. The work fuknction of a material is 4 eV. The longest wavelength of light that causes photoelectron emission from this substances is approximately -

A. 540nm

B. 400nm

C. 310nm

D. 220nm

Answer:

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11. For an electron in the second orbit of Borhr hydroden atom, the angular momentum is-

A. πh

B. $2\pi h$

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

D. $2\frac{h}{\pi}$

Answer:

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12. The binary number of 29_{10}

A. 11101

B. 10111

C. 10001

D. 11001

Answer:

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13. If both the length of an antennam and the wavelength of the singal to be transmitted are doubled, the power radiated by the antenna.

A. is doubled

B. is halved

C. increased16 timesremains constant.

D. remains constant

Answer:

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14. What is the force on a current element I $\overrightarrow{d}\ l$ in a magnetic field?

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15. When a ferromagnetic substance is changed into paramegnetic substances?

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16. The e.m.f of and a.c. current $E = 158 \sin 200\pi t V$. What is the voltage at time $t = \frac{1}{400}$ sec?

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17. Rainbow is not possible in the moon,__Why?

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18. Two lenses of focal lengths 6cm and 50 cm are used in construction of a telescope. Which lens will be used as an objective and why?

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19. Construct Not gate using only NAND gate.

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20. The value of reistance of a carbon resistor is $\left(42 \times 10^{5} \pm 5\,\%\right)\Omega$. What is the colour code of the resistor?

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21. A bulb 60V- 120W is connectd to 220 VDC line what reistance should be connected so that the bulb will glow bright?

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22. What is microwave? Why is ti used in RADAR?

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23. Write two name of e.m. wave. Give one similarity and one dissimilarity of them.

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24. What its the number of revolution per second of revolving electron in first Bohr orbit?

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25. $92^{U^{238}}$ undergoes a series of changes by emitting α and β particles and finally$82^{Pb^{206}}$ is formed. Calculate the number of α and β particles emitted during the change.

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26. What is modem? How is it used?

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27. A positivley charged infinite plane sheet has surface charge density $\alpha\frac{c}{m^2}$. A metalic ball of mass m and charge Q is suspended by an insulated thread from the sheet. What will be the angle with the verticle sheet at the equilibrium condition? What quanity is dipole? Either scalar or vector?

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28. The line charge density of a semicircular ring of radius R is λ. Find electric field intensity at the centre of the ring. What is the total charge of an electric dipole?

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29. Find the potential at the centre of a square of side $\sqrt{2}$ m which carries at its four corners cahrges $+2 \times 10^{-9} C + 1 \times 10^{-9} C$ $+3 \times 10^{-9} C$ and $+4 \times 10^{-9} C$.

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30. Find magnetic moment of an electron revolving in an orbit and hence define Bohr magneton.

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31. A straight wire is used ot form a semi-circular wire of radius 2cm. IF a current I=10A is passing through the wire,then find the

magnitude and direction of magnetic induction at the centre of the semicircle.

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32. A convex lens whose redius of curvatures of both surfaces are same, refractive index 1.5 an focal length is 15cm . If it is immerged into a liquid of refractive index 1.7 what will be the focal length of he lesns?

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33. Why lens formula is called "conjugate focii" relation?

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34. If 'f' is the focal length of a lens then prove $uv = f^2$. U and V represent object and image distances from focus respectively.

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35. What is meant by stopping potential in photoelectric emission? Does the stppping potential depend on the intensity and the frequency of the incident light? Explain.

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36. The wavelength which is generated from microwave oven is 1 cm. In this case find the energy of microwave photon. $\left(h = 6.63 \times 10^{-34} J - s\right)$

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37. Show the unit of $\frac{h}{mv}$ is equal to that of wavelength.

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38. The wavelength of photon of λ is equal to the de-Broglie wave length of electron. Show that energy of photon $= 2\lambda m\frac{c}{h} \times$ kinetic energy of electron .

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39. What is the unit of radioactivity?

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40. What is the unit of radioactivity?

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41. What is the relation between mass defect and binding energy?

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42. Draw a characteristics curve of zener diode showing the variation of volatage with respect to the currrent and indicate the position of "zener voltage" in the graph.

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43. Substract 1101-1011=? (1's complement method)

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44. In a transistor the change in collector current is 706 mA for the change of emitter current of 8.0mA. What is the value of β?

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45. The internal resistance of two cells are I Ω and 2 Ω. Their e.m.fs are 1.5 V and 2 V respectively. The parallel combination of these two cells are connected to an external

resistance 5 Ω.

draw the circuit and find current thorough external resistance.

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46. What is eddy current? Write down an application of it.

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47. A verticle copper disc of diameter 20 cm is rotating uniformly about a horizontal axis passing through its centre with angular speed 600 r.p.m. A uniform magnetic field of strength $10^{-2}T$ acts perpendicular to the plane of the disc. Calculate the potential difference between its centre and a point on the rim of the disc.

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48. Find the power of an A.C. circuit.

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49. A resistance 10Ω a capacitor connected to an ammeter in series with an a.c. source marked 220V -50Hz. If the ammetr reading is 2A, then find capacitive reactance and capacitance.

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50. What is the effect on the interference pattern observed in a youngs double slit experiment in the following cases:

Screen is moved away from the place of the slit.

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51. What is the effect on the interference pattern observed in a youngs double slit experiment in the following cases:

wavelength of monochromotic light is decreased.

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52. What is the effect on the interference pattern observed in a youngs double slit experiment in the following cases:

The source slit is taken near the double slit.

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53. What is the effect on the interference pattern observed in a youngs double slit experiment in the following cases:

The width of the source slit is increased.

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54. What is fraunholer class diffraction?

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55. A light of wave length 589 nm is passed through a single slit of width 1mm and a diffraction pattern is observed. Find angular width of central bright band.

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