



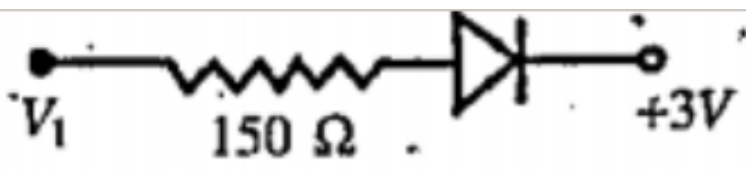
PHYSICS

BOOKS - UNITED BOOK HOUSE

QUESTION PAPER 2019

Example

1. If V_1 increases from $2V \rightarrow 6V$ then change of current will be-



A. zero

B. 20 Ma

C. $80/3\text{mA}$

D. 40mA

Answer:



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2. Two waves, whose intensities are 9,16 are made to interference. The ratio of maximum and minimum intensities in the interference pattern is -

A. 49: 1

B. 49: 16

C. 7: 1

D. 4: 3

Answer:



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3. A straight conductor of length 0.5 m is placed in a magnetic field $\vec{B} (2\hat{i} + 4\hat{j})$ T. It carries a current 1A along +ve x-axis. The magnitude and direction of force acting on the conductor respectively are -

- A. $2N$ along +ve z-axis
- B. $\sqrt{18}N$ along +ve z-axis
- C. $4 N$ along +ve y-axis
- D. $\sqrt{2}N$ along +ve x-axis

Answer:



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4. An α -particle and a proton having same momentum enter into a region of uniform magnetic field and paths $\frac{r_a}{r_p}$ in the field is-

A. 1

B. $\frac{1}{4}$

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

D. 4

Answer:



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5. + q point charge is placed at the centre of a hemispherical surface. Amount of electrical flux crossing through th surface will be

A. q/ϵ_0

B. $q/2\epsilon_0$

C. $q/3\epsilon_0$

D. $2q/\epsilon_0$

Answer:

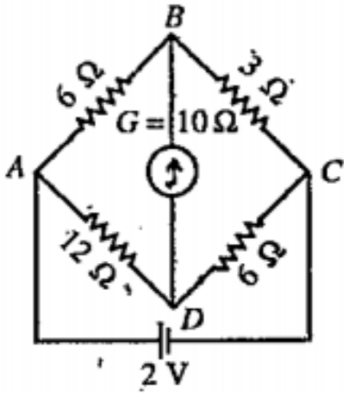


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6. In the circuit

$$AB = 6\Omega, BC = 3\Omega, CD = 6\Omega, DA = 12\Omega, G = 10\Omega$$

Current through galvanometer is-



A. 8.7 mA

B. 708 mA

C. 8.7 A

D. 0

Answer:



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7. Two point charges separated by a distance d apart each other with a repulsion force 9N . If the separation between becomes $3d$, the force of repulsion will be -

A. 1N

B. 3N

C. 6N

D. 27N

Answer:



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8. The process in which the amplitude of the carrier wave is made proportional to the instantaneous amplitude of the signal wave is called

A. Amplitude modulation

B. demolition

C. rectification

D. amplification

Answer:



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9. A biconvex lens behaves like a convergent in air but behaves like a divergent in water. Then refractive index (μ_L) of the lens will be -

A. $\mu_l = 1$

B. $\mu_l = 1.33$

C. $1 < \mu_l < 1.33$

D. $1 < \mu_l < 1.33$

Answer:



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10. The equation of an A. C. is

$$i_o = 3 \sin(\omega t) + 4 \cos(\omega t)$$

Then r,m,s value of this current will be-

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

B. $\frac{4}{\sqrt{2}}$

C. $\frac{7}{\sqrt{2}}$

D. $\frac{5}{\sqrt{2}}$

Answer:



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11. Angle of dip $90^\circ N$ at-

- A. Magnetic south pole
- B. Magnetic north pole
- C. Geographic south pole
- D. Geographic north pole

Answer:



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12. The energy of an electron revolving around the nucleus of H-atom is -1.51 eV . Angular momentum

of this electron will be-

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

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

C. $3\frac{h}{2}\pi$

D. $4\frac{h}{\pi}$

Answer:



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13. A wire is stretched by 1% but volume remains constant, then -

A. resistivity increase by 1%

B. resistivity increases by 2%

C. resistivity decreases by 1%

D. resistivity decreases by 2%

Answer:



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14. The dimension of electric potential is

A. $[ML^2T^{-2}A^{-1}]$

B. $[ML^2T^{-3}A^{-1}]$

C. $[MLT^2 A^{-1}]$

D. $[ML^2 T^3 A^{-1}]$

Answer:



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15. At which temperature is a semiconductor completely transformed to an insulator?



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16. After what time will the direction of current in an electric supply line of frequency 50Hz be reversed?



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17. Which physical quantity has the unit Wb/m^2 ? Is it a scalar or a vector quantity?



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18. Sunray, sodium light and head light of an automobile— which of these light are polarised?



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19. How is the direction of a magnetic field \vec{B} at a point related to the magnetic line of force passing through that point?

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20. A long straight wire of length l is moving within a uniform magnetic field B with a velocity v perpendicular to the field. How much e.m.f. will be induced?

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21. E.M.F. of electrical cell is 2 volt. A 10Ω resistance is joined at its two ends then potential difference is measured 1.6 volt. Find out the internal resistance and lost volt.



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22. A copper wire of length l metre is bent to form a circular loop. If I amp current flows through the loop, find out the magnitude of magnetic moment of the loop.



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23. Write down the Biot-Savart law. Show its vector form.



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24. Name any two electromagnetic waves. State any one similarity and one dissimilarity between them.



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25. How many α and β particles are emitted when U^{238} changes to Pb^{206} due to radioactivity? Atomic

number of U^{238} , Pb^{206} are 92 and 82 respectively.



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26. A TV tower is 120 m high. How much more height is to be added to it if its coverage range is to become double?



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27. Draw a neat diagram of Amplitude Modulated wave. Write down the formula of modulation index.



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28. State Gauss' theorem. With the help of this theorem find out the electrical intensity at any nearby point due to a uniformly charged thin and long straight wire.

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29. Define electrical dipole moment. An electrical dipole with a uniform electric field (E) and is rotated to an angle α_1 to α_2 . Find out the work done.

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30. On what factors does the capacitance of a capacitor depend ?



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31. Two capacitors of capacitances $20\mu F$ and $60\mu F$ are connected in series. IF the potential difference between the two ends of the combination is 40 volt, calculate the terminal potential difference pf each capacitor.



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32. Derive an expression for the torque on a rectangular coil of area A carrying a current I and placed in a uniform magnetic field B . Indicate the direction the torque acting on the loop.



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33. Define electromagnetic unit of current.



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34. Define angle of dip at a place. What will be the value of the angle at the poles and the equator of

the earth? At what place on the earth's surface will the horizontal component of the earth's magnetic field and its vertical component be equal?

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35. Mention how the relative magnetic permeability differs for diamagnetic, paramagnetic and ferromagnetic substances.

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36. What is wavefront of a wave?

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37. In Young's double slit experiment, What is the effect on the interference pattern if, the distance between the two slits is halved.



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38. In Young's double slit experiment, What is the effect on the interference pattern if, The distance between the screen and the plane of slits is doubled.



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39. In Young's double slit experiment, What is the effect on the interference pattern if,

One of the slits is covered with translucent paper.



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40. In case of refraction write down the relation between critical angle and refractive index of the denser medium.



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41. For minimum deviation δ_m , assuming that angle of incidence = angle of emergent, show that the refractive index of the material of the prism is

$$\mu = \frac{\sin \frac{A + \delta_m}{2}}{\sin \frac{A}{2}}$$

Or, Show the ray diagram of a ray of light through a thick another face. Show that $\delta = i_1 + i_2 - A$ and $A = r_1 + r_2$. The symbols have their usual meaning.



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42. An object of height 2.5 cm placed perpendicularly on the principle axis of a concave mirror of focal

length f at a distance of $\frac{3}{4}f$. What will be the nature of the image of the object and its height?



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43. A person uses spectacles of power $+2D$. What type of defect of vision is it?



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44. Under what potential difference should an electron be accelerated to obtain de Broglie,

wavelength

of

$0.6\overset{\circ}{\text{A}}$?

$$(h = 6.62 \times 10^{-34} \text{ j. s}, m_e = 9.1 \times 10^{-31} \text{ kg})$$



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45. Give an example of production of electron by photons.



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46. Write down Eistein's photoelectric equation.



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47. Light rays of wavelength λ and $\frac{\lambda}{2}$ are incident on a photosensitive metal surface, IF the maximum kinetic energy of the emitted photoelectrons from the metal surface in 2nd case be 3 times the maximum kinetic energy of emitted photoelectrons in the 1st case then determine the work function of the metal.



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48. If the value of Rydberg constant of hydrogen is 109737 cm^{-1} determine the longest and shortest wavelengths of the Balmer series.

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49. What is meant by half life of a radioactive element?

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50. What are the majority and minority carriers in a p-type semiconductor?

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51. Write down the symbol and truth table OR gate.



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52. Convert the binary number 10011 into decimal equivalent .



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53. Why are Si and Ga-As preferred materials for solar cell?



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54. Transistor-what does it mean ?



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55. When an n-p-n transistor is used as an amplifier?



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56. In a potentiometer experiment why is it necessary to use a long wire?

Length and resistance of a potentiometer wire are 4m and 10Ω respectively. It is connected to a cell of emf 2 volt. Another cell when joined to this potentiometer

and null point is measured at 250 cm. Find out the emf of the second cell.



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57. In a meter bridge when the resistance in the left gap, is 2Ω and an unknown resistance in the right gap, the balance point is obtained at 40 cm from Zero end. On shunting the unknown resistance with 2Ω find the shift of the balance point on the bridge.



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58. What is shunt?



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59. Explain wheatstone bridge principle with the help of Kirchhoff's law. Does the principle of Wheatstone bridge change in the position of battery and galvanometer are interchanges?



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60. 36 cells each of internal resistance 0.5Ω and $emf\ 1.5V$ each are used to send current an external

circuit of 2Ω resistance. Find the best mode of grouping them for maximum current of and the current through the external circuit.

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61. Lenz's law of electromagnetic induction corresponds to

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62. .What is eddy current?

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63. What is meant by 'self-inductance of coil is 1 H'?



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64. What is meant by self-induction of a solenoid.



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65. Establish an expression for self-inductance of a solenoid.



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66. An a.c. source generating voltage $e = e_0 \sin \omega t$ is connected to a capacitor of capacitance C . Find the expression for the current I flowing through it. Plot a graph of e and I versus ωt



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67. Determine the resonant frequency ω_r of a series LCR circuit with $L=2.0$ H, $C=32\mu F$ and $R=10\Omega$. What is the Q -value of this circuit?



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68. Two convex lenses of focal lengths f_1 and f_2 respectively are placed in contact each other. Then what will be power of their equivalent lens?

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69. write down the conditions for constructive interference.

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70. The refractive index of glass is 1.55 what is its polarising angle? Determine the angle of refraction

for the polarising angle.



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