PHYSICS

BOOKS - PUNJAB BOARD PREVIOUS YEAR PAPERS

Electric Current, Resistance and E.M.F.

Exercise

1. A current 5.0A flows through an electric press of resistance 11Ω Calculate the energy

consumed by the press in 5 minutes.

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2. A lamp of 100 W works at 220 volt. What is its resistance and current capacity?

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3. A 60W-220V bulb and 100W-220V bulb are connected in parallel to main supply. Which bulb will draw more current?

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4. What is resistance of carbon resistance on which colour of ring in sequence is black, brown, black and gold?

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5. A carbon resistor of $47k\Omega$ is to be marked with rings of different colours for its identifincation. Write its sequence of colours.

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6. What is the colour coding of strips on the carbon resistor of resitor $200\Omega \pm 10\,\%$?

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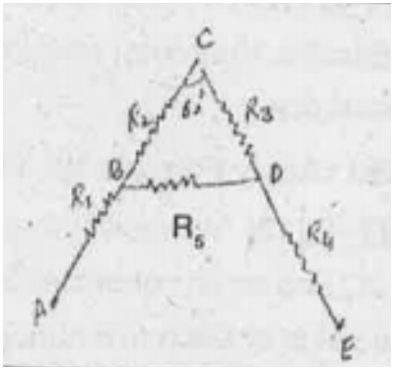
7. A letter .A. consists of a uniform wire of resisrtance .A. one ohm per cm. The sides of the letter are each 20 cm long and crosspiece in the middle is 10cm long, while the apex angle is 60°. Find the resistance of the letter

between two ends of the legs A. and E as shown in figure given below.



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8. To produce 10^3 Joules of heat in 10 seconds, how much voltage should be applied to 100 ohm resistance?

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9. A current of 5 ampere flows in a 10 ohm resistor. Calculate rate of heat energy produced in the resistor.

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10. A heater is rated as 220 volts, 880 watts. What is the current drawn by the heater when connected to a 220V a.c. mains? Calculate the resistance of heater.

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11. A carbon resistor has three colours yellow, blue and red respectively. What will be the resistance ?

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12. A carbon resistor has three colours red, yellow and blue respectively. What will be the resistance ?

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13. Two resistances when connected in series give a total resistance of 18Ω and when connected in parallel gives a total resistance of 4Ω. Find the value of each resistance.

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14. Two resistances are inthe ratio of 1:4.If these are connected in parallel, their total

resistance becomes 16Ω. Find the value of each resistance.

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15. Two resistances when connected in series give a resistance of 9Q and when connected in parallel gives a resistance of 2Ω.Calculate the.value of each resistance.

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16. How will you represent aresistance of 3700 $\Omega \pm$ 10% by colour coding?

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17. Calculate the resistivity of the material of wire 1.0 m (meter) long 0.4 mm (millimeter) in diameter and having resistance of 2.0 ohm.

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18. A wire of length15m (meter) and uniform area of cross section $6.0 \times 10^{-7} m^2$ has resistance of 5.0Ω (ohm). What is the resistivity of the material of the wire ?

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19. A wire of length 2.0 m, diameter 1.0 mm has $50 \times 10^{-3}\Omega$ (ohm) resistance. Calculate the resistivity of the material of a wire.

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20. A parallel combination of three resistors takes a current of 5A from a 20V supply. If the two resistors are of 10 ohm and 8 ohm, find the value of third resistor.

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21. The parallel combination of three resistors takes a current of 7.5A from a 30V supply. If the two resistors are of 10 ohm and 12 ohm, find the third one.

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22. A series combination of three resistors takes a current of 2A from a 24V supply. If the resistors are in the ratio 1 : 2 :3, find the value of unknown resistors.

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23. A wire has a resistance of 10.5Ω at $21^\circ C$ and 16.4Ω at $147^\circ C$. Find the value of

temperature coefficient of resistance.

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24. A resistance of a tungsten filament at $150^{\circ}C$ is 133Ω.What will be its resistance at $500^{\circ}C$? The temperature coefficient of resistance of tungsten at $0 \circ C$ is $0.0045 \circ C^{-1}$.

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25. A silver wire has a resistance of 2.1Ω at $27.5^{\circ}C$ and a resistance of 2.7Ω at $100^{\circ}C$. Determine the temperature coefficient of wire

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26. Three identical cells of emf 4V each and unknown internal resistances are connected in parallel.The combination is connected to 10 ohm resistor. If terminal voltage across the cells is 2V, find internal resistance of each cell.

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27. If maximum resistance from the combination of two resistances is 18 ohm and minimum resistance is 4 ohm, find two resistances

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28. A wire with an area of cross-section as $10mm^2$ has a resistance of 5Ω, when a potential difference across its ends is 25V.

Calculate the drift velocity of electrons. Given the number density of electrons as 5×10^{20} electrons per cubic meter (e/m^{-3})

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29. A wire with an area of cross-section as 1 mm2 has a resistance of 10Q, when a potential difference across its ends is 8V. Calculate the drift velocity of electrons. Given,number density of electrons in wire as 8×10^{20} electrons per cubic meter.

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30. Given three resistors of resistances 1Q (Ohm), 2Q (Ohm) and 3Q (Ohm). How will you combine them to get an equivalent resistance of $\frac{11}{5\Omega}$ (Ohm) ?

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31. How many electrons pass through alamp inone minute if current flowing in lamp is 200mA ?

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32. How does the conductivity of metals varies with the rise in their temperature?

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33. Why Eureka metal is used to make standard resistance coil?

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34. Why copper is used to make connecting wires ?

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35. How does the conductivity of semi-conductors varies with the rise in their temperature ?

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36. Why Manganin is used to make standard resistance coil ? How does the electric resistance of metal varies with the rise in its temperature ?

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37. Define one Ampere of current.

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38. What is the resistance of an ideal voltmeter and an ammeter?

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39. The specific resistance of a conductor increases with Increase in temperature:

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40. The specific resistance of a conductor increases with Increase in cross-sectional area..

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41. The specific resistance of a conductor increases with Decrease in length

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42. The specific resistance of a conductor increases with Increase in cross-sectional area..

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43. Why the fuse wire should have high resistance and low melting point?

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44. Why the fuse wire should have high resistance and low melting point?

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45. A fuse wire is a wire of Low resistance and high melting point.

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46. Why the fuse wire should have high resistance and low melting point?

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47. One kilowatt hour is equal to

A. $36 \times 10^5 J$

B. 36 × 10^3 J`

C. $36 \times 10^{-5} J$

D. $3.6x10^{-6} J$

Answer:

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48. Which out of the following is used to make standard resistance

A. Carbon

B. Copper

C. Silicon

D. Constanton

Answer:

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49. The rings on carbon resistance have colours in the sequence Red,Yellow, Violet and Silver.Then resistance is :

A. $24x10^7 \pm 10\,\%$

B. $42 \times 105 \pm 10\,\%$

C. $68 \times 104 \pm 10\,\%$

D. $37 \times 10^2 \pm 5\,\%$

Answer:

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50. With increase in temperature, resistance of metals :

A. decreases

B. increases

C. first decreases then increases

D. remains constant

Answer:

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51. For alloys the value of temperature coefficient of resistance is very high. (True/False)

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52. For metallic conductors the value of temperature coefficient of resistance is

negative. (True/False)

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53. S.I. unit of electromotive force is volt. (True/False)

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54. On what factor does the internal resistance of a cell depends?

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55. With the help of a diagram derive the formula for the equivalent resistance of three resistances connected in parallels?

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56. What is the internal resistance of a cell ? How it can be measured ?

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57. What is Non-ohmic device ? Give one example.

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58. What is a drift velocity ? Establish the relations between the drift velocity and electric current.

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59. If drift velocity of electron as well as charge on electron is very small, how can we still obtain large amount of current in aconductor?

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60. Define internal resistance of a cell and find an expression for it.

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61. Establish the relation between drift velocity of electrons and electric field applied to the conductor.

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62. The number density of free electrons in a metal piece is a very large of the order of $10^{+29}m^{-3}$. Why is there no current in the metal piece in the absence of electric field across it ?

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63. Standard resistance coils are made up of which material why ?

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64. What is the effect of the temperature on resistivity of metals

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65. What is the effect of the temperature on resistivity of semiconductors ?

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66. Why connecting wires are made up of copper ?

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67. What is resistance of a wire ? What are the factors on which resistance of a conductor

depends?

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68. What is the difference between emf of a cell and potential difference of a cell?

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69. What is resistivity of a wire ? What are the physical conditions on which resistivity of a metal depends ?

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70. What are the factors on which the resistance of the conductor depends hence define resistivity of the conductor ?

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71. Distinguish between emf and potential difference.

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72. Explain colour code for carbon resistor .

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73. Establish the relation between drift velocity of electrons and electric field applied to the conductor.

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74. A large number of free electrons are present in metals.Why is there no current in the absence of electric field across it ?

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75. What is a drift velocity ? Establish the relations between the drift velocity and electric current.

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76. Why connecting wires are made up of copper ?

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77. What are ohmic and non-ohmic devices ? Give one example of each.

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78. What is the resistance of a conductor? State the factors on which resistance of a conductor depends?

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79. Which out of the following is used to make standard resistance

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80. Why connecting wires are made up of copper ?

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81. Standard resistance coils are made up of which material why ?

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82. What is the internal resistance of a cell ? Derive an expression for it.

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83. Why connecting wires are made up of copper ?

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84. What is the internal resistance of a cell ? Derive an expression for it.

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85. What is e.m.f. of a cell ? On what factors does its value depend ?

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86. Establish the relation between drift velocity of electrons and electric field applied to the conductor.

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87. What do you mean by conductivity of a material? Give its SI unit.

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88. What is effect of rise in temperature on the resistivity of metallic conductors and semiconductors ?

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89. What is meant by resistivity ? Write its S.I. unit.

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90. What is the effect of rise in temperature on the conductivity of copper and silicon ?

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91. What is meant by resistance of conductor and define its units.

Watch Video Solution

92. What is effect of rise in temperature on the conductivity of metallic conductors and semiconductors ?

Watch Video Solution

93. Distinguish between emf and potential difference.

Watch Video Solution

94. What is the internal resistance of a cell ? Derive an expression for it.

Watch Video Solution

95. What is a drift velocity ? Establish the relations between the drift velocity and electric current.

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96. State Ohm's law. Derive the laws of resistance, when they are connected in series

Watch Video Solution

97. State Ohm's law. Derive the laws of resistance, when they are connected in parallel.

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98. Find the equivalent of resistances of the individual resistance connected in series?

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99. With the help of a diagram derive the formula for the equivalent resistance of three resistances connected in parallels?

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100. State Ohm's law and derive it from the basic idea of drift velocity of electrons.

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