



PHYSICS

BOOKS - CHETANA PHYSICS (MARATHI ENGLISH)

EFFECTS OF ELECTRIC CURRENT

Exercise

1. The direction of magnetic field due to electric current is decided by_____ A. Right

hand thumb rule B. Fleming's left hand rule C.

Fleming's right hand rule D. None of the above

A. Right ahdn thumb rule

B. Fleming's left hand rule

C. Fleming's right hand rule

D. None of the above

Answer:



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2. The device which converts mechanical energy into electrical energy is called___ A. Electric bell B. Electric generator C. Electric fuse D. Electric motor

A. Electric bell

B. Electric generator

C. Electric fuse

D. Electric motor

Answer:



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3. 1 mA = _____

A. 10^{-6} A

B. 10^{-3} A

C. 10^6 A

D. 10^3 A

A. A. 10^{-6} A

B. B. 10^{-3} A

C. C. 10^6 A

D. D. 10^6 A

Answer:



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4. 1 kWh = _____ A. $36 \times 10^6 J$ B. $3.6 \times 10^6 J$ C.
 $0.36 \times 10^6 J$ D. $3.6 J$

A. $36 \times 10^6 J$

B. $3.6 \times 10^6 J$

C. $3.6 \times 10^6 J$

D. $3.6 \times 10^6 J$

Answer:



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5. The deflection of the pointer of _____ is on either side of zero mark A. Voltmeter B. Ammeter C. Galvanometer D. Thermometer

A. Voltmeter

B. Ammeter

C. Galvanometer

D. Thermometer

Answer:



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6. If the potential difference across a wire is 2 V and the current through the wire is 1A, the electric power is _____.



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7. At the Centre of which of the following four circular rings is the magnetic field strongest,

for equal magnitude of current?



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8. Which of the following is used to find the direction of the magnetic lines of force around a conductor? A. Bar magnet B. Magnetic needle C. Disc magnet D. spherical magnet

A. Bar magnet

B. Magnetic needle

C. Disc magnet

D. spherical magnet

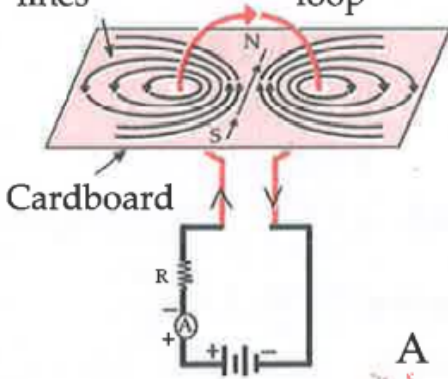
Answer:



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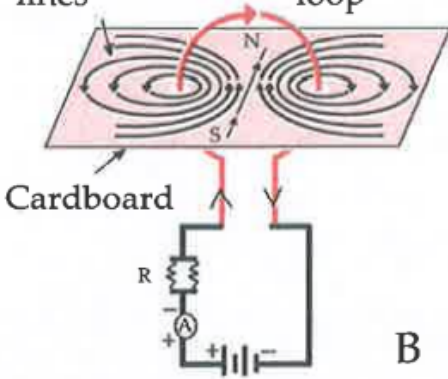
9. Write the correct option by observing the figures:

Magnetic lines Conductor loop



A

Magnetic lines Conductor loop



B

A. Magnetic field in A is stronger

B. Magnetic field in B is stronger

C. Magnetic fields in A and B are same

D. magnetic fields in A and B are weaker

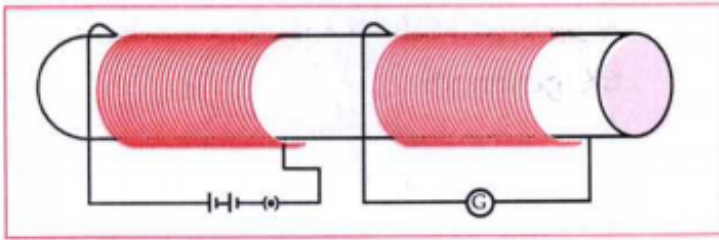
Answer:



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10. In the arrangement shown in figure, there are two coils wound on a non-conducting cylindrical rod. Initially the key is not inserted. Then the key is inserted and later

removes. Then,



- A. The galvanometer will not deflect
- B. The galvanometer will deflect in one direction when the key is inserted and in the opposite direction when the key is removed
- C. The galvanometer will deflect in one direction when the key is inserted and remain still when the key is removed
- D. The galvanometer will deflect in one direction when the key is

inserted and in the same direction when the key is removed .

A. The galvanometer will not deflect

B. The galvanometer will deflect in one direction when the key is inserted and in the opposite direction when the key is removed

C. The galvanometer will deflect in one direction when the key is inserted and

remain when the key is inserted and remain still when the key is removed .

D. The galvanometer will deflect in one direction when the key is inserted and in the same direction when the key is removed .

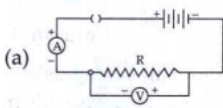
Answer:



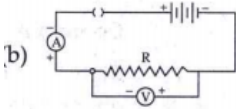
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11. Out of the four circuits shown, for studying the dependence of current on the potential difference across a resistor, the correct circuit is

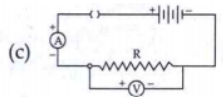
A.



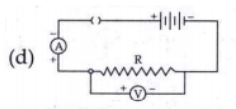
B.



C.



D.



Answer:



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12. The intensity of magnetic field is expressed in _____. A. Ampere B. volt C. coulomb D. oersted

A. ampere

B. volt

C. coulomb

D. oersted

Answer:



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13. The resistance of wire is 25 ohm due to electric current passing through it, 6.25 J/sec heat is generated in the wire .Fire the potential difference



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14. If 90 W bulb is connected to a circuit with potential difference of 360 V , find the current flowing through the bulb?



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15. If the bulb of 60 W is connected across a source of 220 V. find the electric current drawn by it .



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16. A potential difference of 250V is applied across a resistance of 1000 *ohm* is an electric iron. Find (i) the current and (ii) heat energy produced in 12 sec.



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17. Find the resistance of coil of power 60 W when potential difference of 240 V is applied across it



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18. If a bulb is rated 220 V and 100 W. Find resistance



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19. An electric current of 5 A flows through a wire of resistance 41.8 ohm Find the time to obtain heat of 3000 cal.



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20. The potential difference of 260 V is applied at the domestic circuit. An LED is connected to the circuit. An electric current of 0.35 A flows through the LED. Then

(i) Power of LED

(ii) Units consumed if the bulb is operating for 10 hr.



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21. A 300 W T.V is operated every day for 6 hr.

Find the electrical energy (no.of units)consumed.



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22. An electric iron rated 750 W operates 2 hours/day. If the cost of unit is 3 rs. per KWh. Find the cost of energy to operate electric iron for 30 days.



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23. If T.V.of rating 10 W is operated for 6 hr per day,find the number of units consumed in a leap year.



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Example

1. Find the odd word out

Fuse wire,insulator,rubber gloves,generator



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2. Find the odd word out

Voltmeter,Ammeter,Thermometer,Galvanometer



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3. Find the odd word out

Loudspeaker, Microphone, Electric

motor, Magnet



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4. Find the odd word out

Armature coil, Burshes, Magnet direct current



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5. Find the odd word out

Refrigerator, Electric fan ,Mixture, Electric
water heater



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6. Find the odd word out

Fuse wire, Nuetral wire, Earthing wire, Live wire.



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7. Find the odd one out : Electric heater, Electric bulb, Electric fuse, Electric press



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8. Find the odd word out

Electric bell, Electric fuse, solenoid, Microphone



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9. What is heating effect of an electric current?



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10. What are the appliances that work on the principle of heating effect of electric current?



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11. What is solenoid?



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12. What is electric motor?



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13. What do you understand by the term "Direct current(D.C.)?"



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14. What is alternating current(A.C.)?



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15. Name two types of electric current?



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16. Name the types of electric generator.



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17. Name the three types of wires or cables used in domestic electric circuit.



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18. Which electrical appliance converts electrical energy into mechanical energy?



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19. What is the frequency of alternating current (A.C.) ?



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20. What do you mean by induced current?



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21. Name the two components or devices used for the safety of electrical gadgets?



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22. Write the relation between kilowatt hour and joule.





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23. Write will the induced current in the electrical conductor(coil) be maximum?



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24. Match the columns:

Column A	Column B
(1) Fleming	(a) Relation between electric energy and magnetism
(2) Faraday	(b) Law of electromagnetic induction
(3) Oersted	(c) Magnetic field, direction of electric current direction of motion of a conductor.



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25. Match the columns:

Column A		Column B	
(1)	Earthing wire	(a)	Electric motor
(2)	Overloading	(b)	Electric generator
(3)	Electromagnetic force	(c)	Protection against electric shock
(4)	Electromagnetic induction	(d)	Excessive electric current



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26. Match the columns:

Column A	Column B
(1) Right hand thumb rule	(a) Magnetic effect of electric current
(2) Hans Oersted	(b) Properties of a bar magnet
(3) Solenoid	(c) Do not intersect each other
(4) Magnetic lines of force	(d) Direction of current and magnetic field



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27. Match the columns:

Column A	Column B
(1) Electric generator	(a) Transmitted over long distances
(2) Electric motor	(b) Unidirectional flow of current
(3) Direct current	(c) Converting mechanical energy into electrical energy
(4) Alternating current	(d) Used in mixers, refrigerator etc.



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28. True or false

The SI unit of electric charge is coulomb(C).



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29. True or false

The SI unit of electric current is volt(V).



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30. True or false

Resistivity of a conductor does not depend upon its temperature.



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31. True or false

The filament in the electric bulb is made of a wire with high melting point



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32. True or false

The direct current always in one direction only



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33. True or false

The electric motor is used to generate electricity.



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34. True or false

During lightning, all the electrical appliances must be switched off.



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35. True or false

Many high power rating electrical appliances can be connected to a circuit at a time



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36. True or false

Direct current has a frequency of 50 Hz in India



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37. True or false

Electric power (P)=VI



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38. True or false

According to Ohm's law, $V = I \times t$



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39. True or false

The production of heat in a wire when connected to electric circuit is called heating effect of an electric current.



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40. True or false

$$1kWh = 3.6 \times 10^9 J$$



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41. True or false

1 KWh electric unit = 10 units.



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42. True or false

The device which converts electrical energy to mechanical energy is called an electric generator



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43. True or false

Alternating current is perfectly used for domestic electric circuits.



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44. True or false

Many high power rating electrical appliances can be connected to a circuit at a time



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45. True or false

When a live wire and a neutral wire come in contact with each other, it may cause short circuit



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46. Heat energy is being produced in a resistance in a circuit at the rate of 100 W. The current of 3 A is flowing in the circuit. What must be the value of the resistance?





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47. Two tungsten bulbs of wattage 100 W and 60 W power work on 220 V potential difference. If they are connected in parallel, how much current will flow in the main conductor?



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48. A 6 m long wire made from an alloy, nichrome, is shaped into coil and given for

producing heat. It has a resistance of 24 ohm. Can we get more heat if the wire is cut into half of its original length and shaped into a coil? For getting energy, the two ends of the wire are connected to a source with a potential difference of 220 V.



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49. An electric iron a power of 1100 W when set to higher temperature .If set to lower temperature, it uses 330 W power Find out the

electric current and the respective resistance of 220 V.



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50. A cell is connected to a 9 ohm resistance, because of which heat of 400 J is produced per second due to current following through it. Obtain the potential difference applied across the resistance.



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51. Who will spend more electrical energy, 500 W TV set in 30 mins or 600W heater in 20 mins?



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52. An electric tungsten bulb is connected into a home circuit. The home electric supply runs at 220 V potential difference. When switched on, a current of 0.45 A flows through the bulb. What must be power (wattage) of the bulb? if it is kept on for 10 hours, how many units of electricity will be consumed?



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53. An electric iron of 1100 W is operated for 2 hrs. daily. What will be the electrical consumption expenses for the month of April? (The electric company charges rs.5 per unit of energy).



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54. An electric iron rated 750 W operates 2 hours/day. If the cost of unit is 3 rs. per KWh. Find the cost of energy to operate electric iron for 30 days.



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55. A washing machine rated 300 W operates one hour/day. If the cost of unit is $\text{rs.}3.00$ find the cost of the energy to operate a washing machine for the month March.





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56. If a TV of rating 100 W is operated for 6 hours per day, find the number of units consumed in a leap year.



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57. Write the definitions/laws:

AC generator:



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58. Write the definitions/laws:

DC generator:



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59. Write the definitions/laws:

Right Hand Thumb Rule:



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60. Write the definitions/laws:

Fleming's left hand rule,



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61. Write the definitions/laws:

Heating effect of electric current



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62. Write the definitions/laws:

Fleming's Right Hand Rule:



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63. Write the definitions/laws:

Maxwell's cork screw rule:



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64. Write the definitions/laws:

Faraday's law of induction



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65. Distinguish between :

AC generator and DC generator.



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66. Distinguish between :

AC motor an AC generator.



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67. Distinguish between :

Short circuiting and Overloading.



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68. Distinguish between :

Direct current and Alternating current.



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69. Give Scientific reasons:

Tungsten metal is used to make a solenoid type coil in an electric bulb



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70. Give Scientific reasons:

In the electric equipment's producing heat e.g. iron, electric heater, boilers, toaster etc. and alloy such as Nichrome is used, not pure metal



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71. Give Scientific reasons:

For electric power transmission, copper or aluminium wire is used



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72. Give Scientific reasons:

In practice the unit KWh is used for the measurement of electrical energy rather than joule



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73. Why are carbon brushes used?How do these work?



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74. Give Scientific reasons:

Iron is a conductor of electricity, but when we pick up a piece of iron resting on the ground, why don't we get electric shock?



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75. Give Scientific reasons:

The material used for making fuse wire has a low melting point.



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76. If lines of force passing through the coil are increased, will current be induced? why?



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77. What is overloading?



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78. How does short circuit form?What is its effect ?



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79. What is Solenoid?Compare the magnetic field produced by a solenoid with the magnetic field of a bar magnet.Draw neat figure and name various components



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80. Describe with a neat diagram : Voltmeter



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81. How can we write mechanical power in a manner similar to the electrical power?



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82. Derive joules Law with the help of a neat circuit diagram.



83. In the above circuit, if the resistor is replaced by a motor, in which form will the energy given by the cell get transformed into?

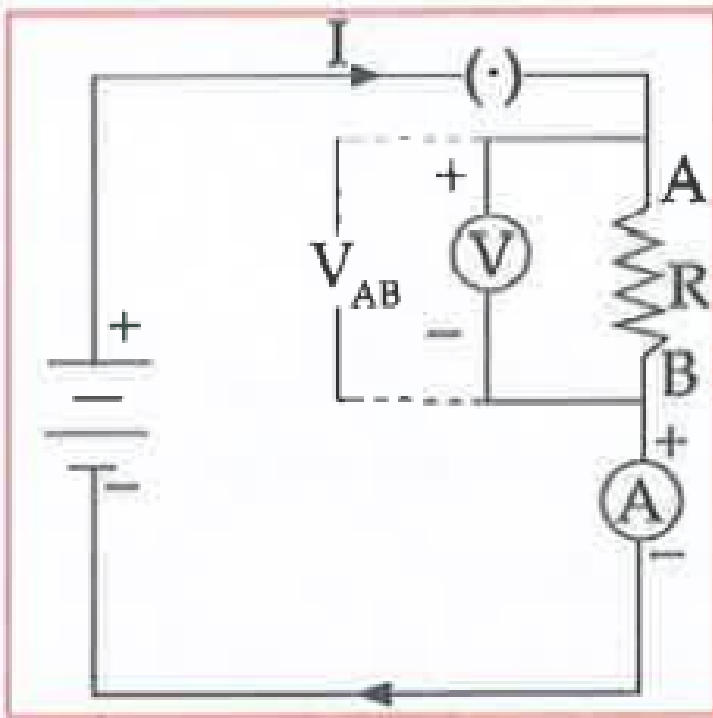


Fig 4.3



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84. How will you increase the strength of magnetic field in an electromagnet?



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85. Write a note on Galvanometer.



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86. What do you mean by earthing?



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87. State the factors on which the strength of the magnetic field of a circular loop depends ?



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88. Which of the statement given below correctly describes

The magnetic field near a long, straight current carrying conductor?

- (a) The magnetic lines of force are in a plane perpendicular to the conductor in the form of straight lines.
- (b) The magnetic lines of force are parallel to the conductor on all the sides of a conductor.
- (c) The magnetic lines of force are perpendicular to the conductor going radially outward.
- (d) The magnetic lines of force are in concentric circles with the wire at the centre, in a plane perpendicular to the conductor.



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89. Which of the statement given below correctly describes

Electromagnetic induction

- (a) Charging of an electric conductor.
- (b) Production of Magnetic field due to a current flowing through the coil.
- (c) Generation of a current in a coil due to relative motion between the coil and the magnet.
- (d) Motion of coil around the axle in an electric motor.



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90. State the rule you will use: To find direction of the motion of a conductor if direction of the current and magnetic field are known to you



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91. To find the direction of the induced current, if the direction of motion of conductor and magnetic field are known to you



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92. Identify the figure and explain the uses of following:



Fig 4.4



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93. Identify the figure and explain the uses of following:

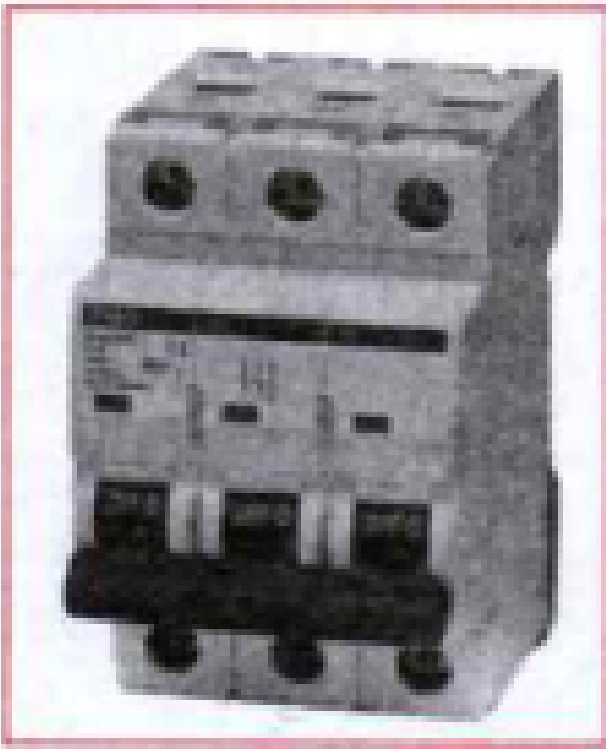


Fig 4.5



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94. Identify the figure and explain the uses of following:

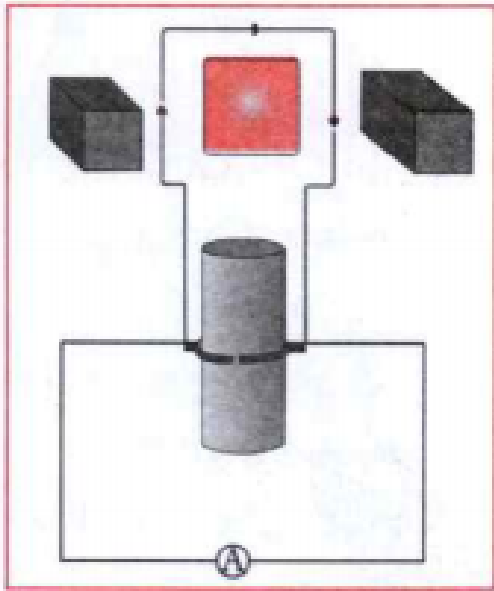


Fig 4.6



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95. Name the following diagrams and explain the concept behind them

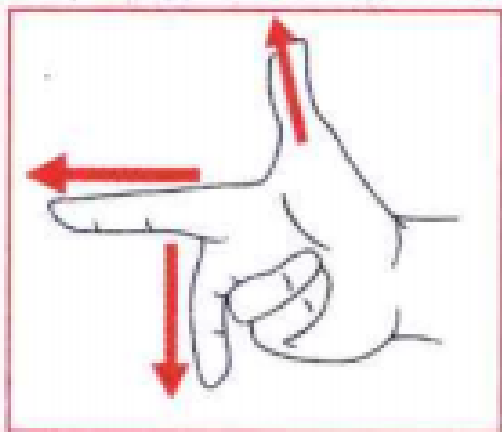


Fig 4.7



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96. Name the following diagrams and explain the concept behind them

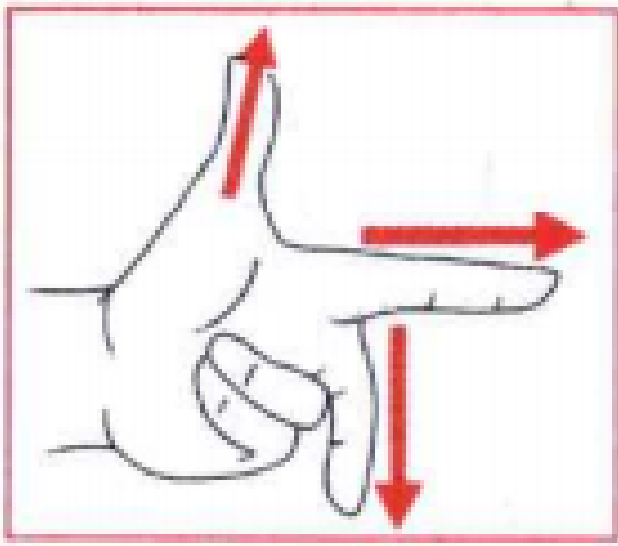


Fig 4.8



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97. Name the following diagrams and explain the concept behind them

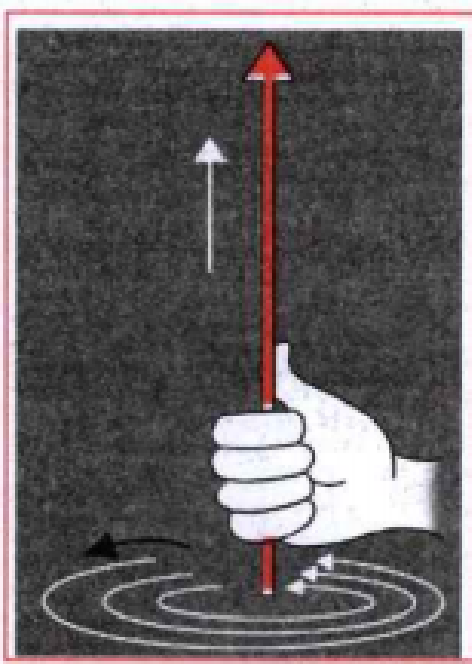


Fig 4.9



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98. Answer the following based on the graph given below.

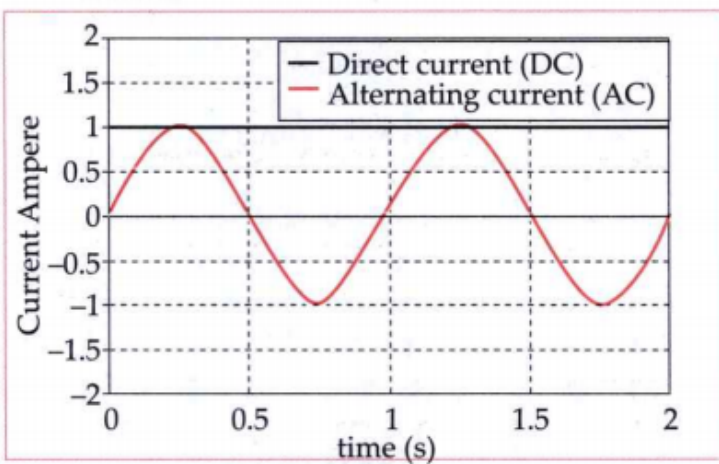


Fig 4.10

After

how many seconds does AC change its direction?



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99. Answer the following based on the graph given below.

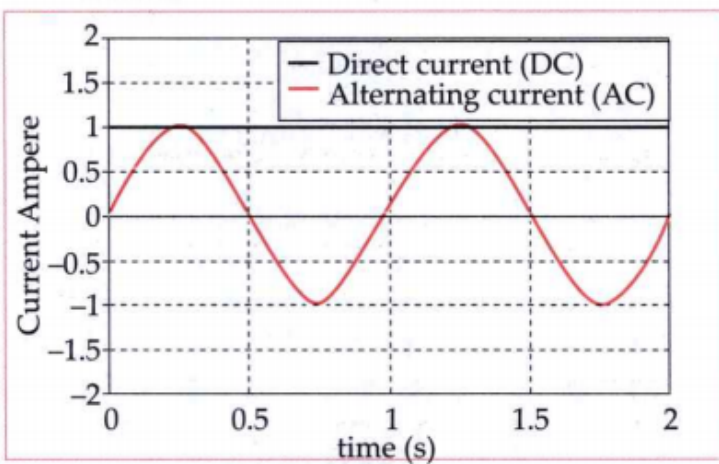


Fig 4.10

What is

the maximum value of AC?



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100. Answer the following based on the graph given below.

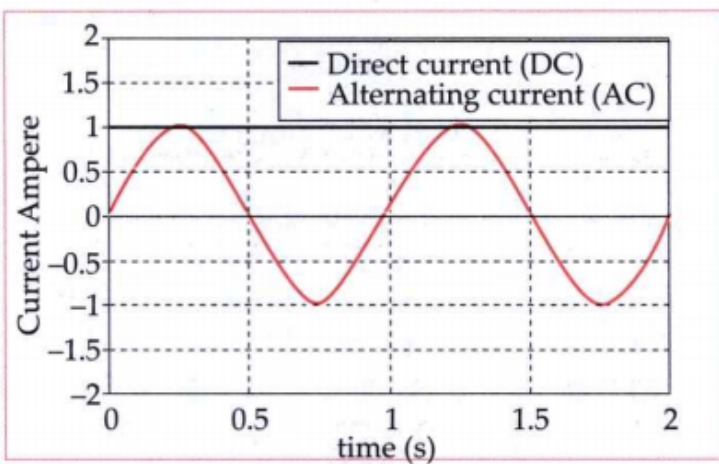


Fig 4.10

what is

the maximum value of DC?



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101. Answer the following based on the graph given below.

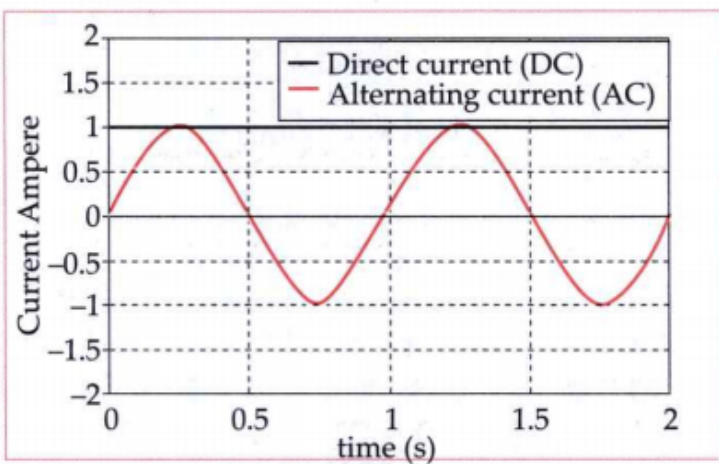


Fig 4.10

What is

the time interval for 1 cycle of AC?



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102. Answer the following based on the graph given below.

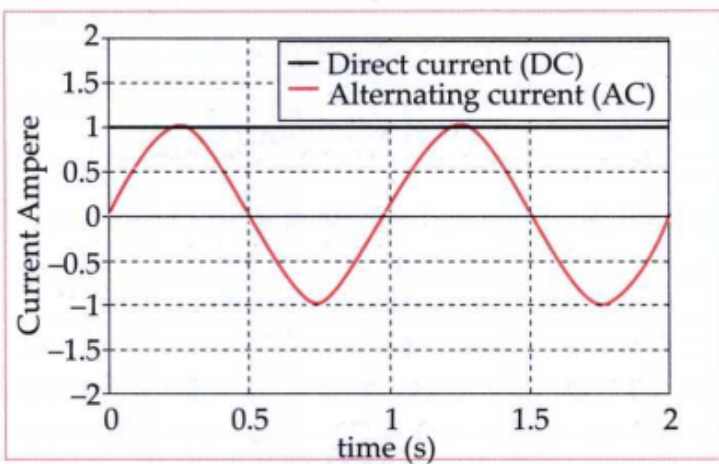


Fig 4.10

What is

the frequency of AC and DC?



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103. What change do we observe in the Galvanometer when the current in the Solenoid coil is switched off?



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104. What change do we observe in the Galvanometer when a current is passing through the solenoid coil and the coil is displaced laterally with respect to the coil?



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105. What change do we observe in the galvanometer if the displacement of the solenoid is faster?



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106. What change do we observe in the galvanometer if the current in the solenoid coil is increased?



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107. Name and state the law responsible for the above phenomena

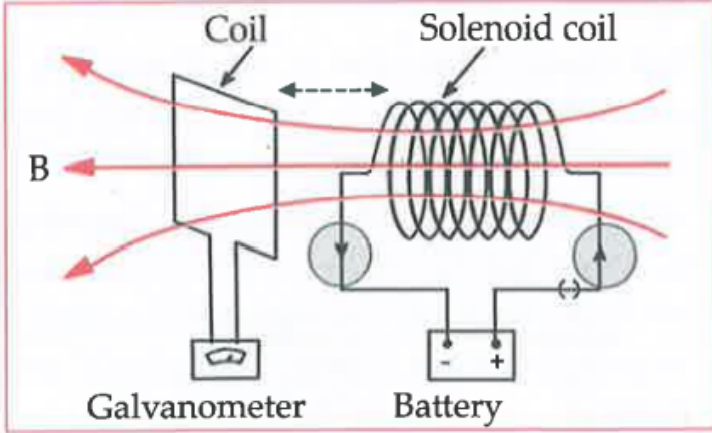
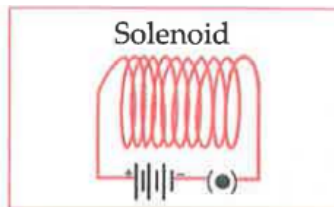


Fig 4.11

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108. Answer the following based on the diagram given below.



- (i) Complete the diagram of magnetic lines of force passing through a solenoid.

109. Answer the following based on the diagram given below.

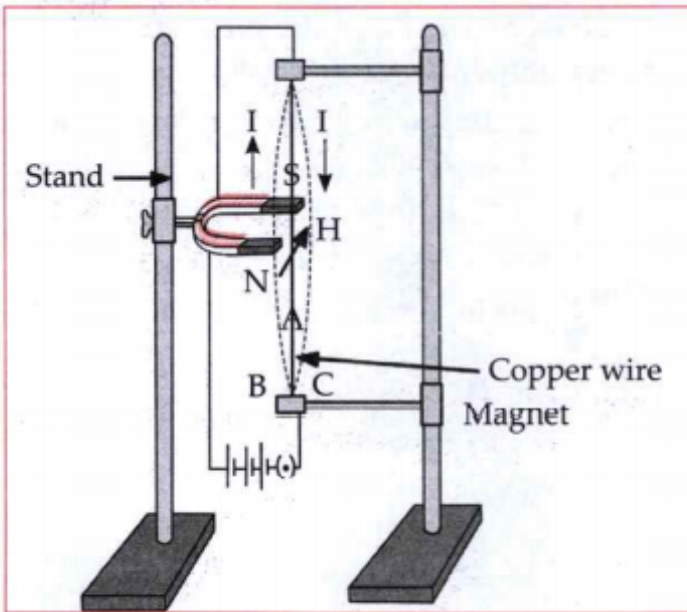


Fig 4.12

What is the direction of the force experienced

by the conductor when the current is downward?



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110. If the conductor experiences force inwards, then what would be the direction of current ?



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111. Answer the following based on the diagram given below.

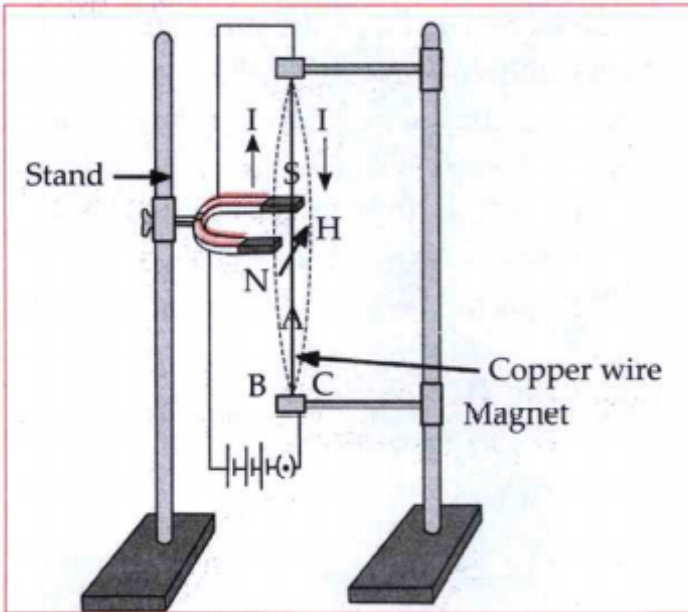
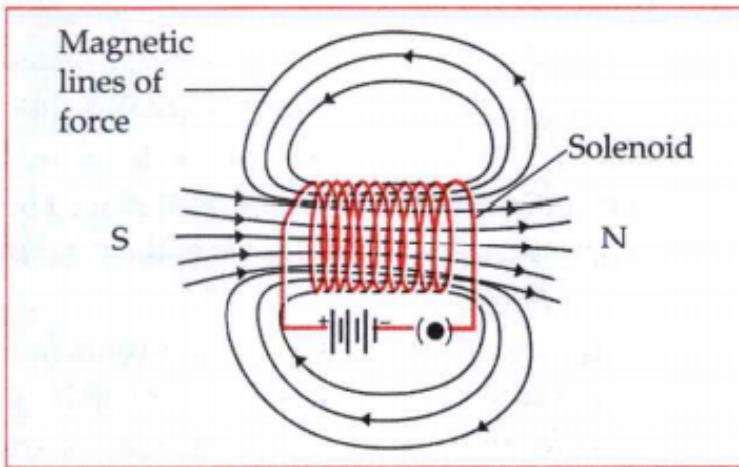


Fig 4.12

What is the direction of the force experienced by the conductor when the current is downward?

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112. Complete the diagram of magnetic lines of force passing through a solenoid



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113. Define: Solenoid



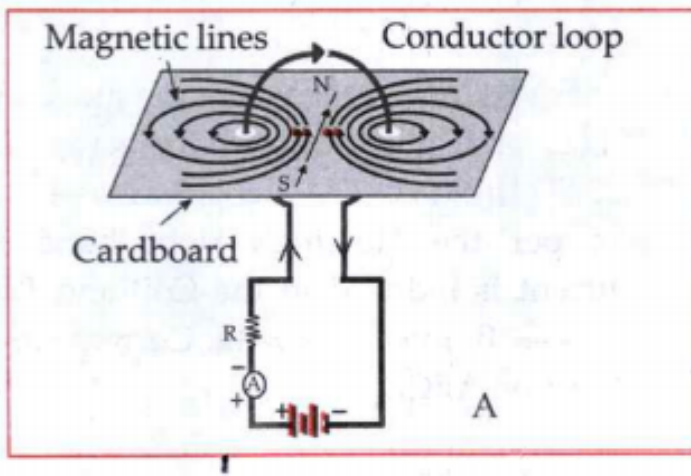
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114. What is the nature of the magnetic field inside the solenoid?



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115. Answer the following based on the diagram given below.

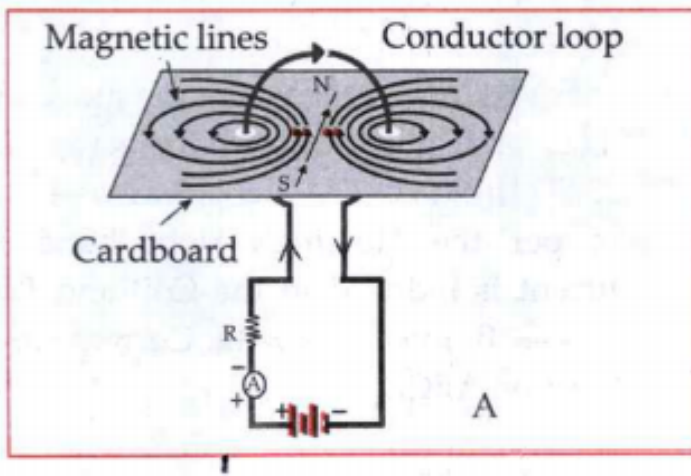


Which

rule help to find the direction of magnetic field?

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116. Answer the following based on the diagram given below.



State

any 2 factors on which the strength of magnetic field, for a circular loop depends?

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117. Draw a neat and labelled diagram:

Circuit for Direct Current

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118. Draw a neat and labelled diagram:

Circuit for Alternating Current



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119. Draw a neat and labelled diagram:

DC generator



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120. Draw a neat and labelled diagram:

Magnetic lines of force through a Solenoid



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121. Define AC Generator.



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122. Write the definitions/laws:

DC generator:



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123. What do you observe in the following Pictures?:

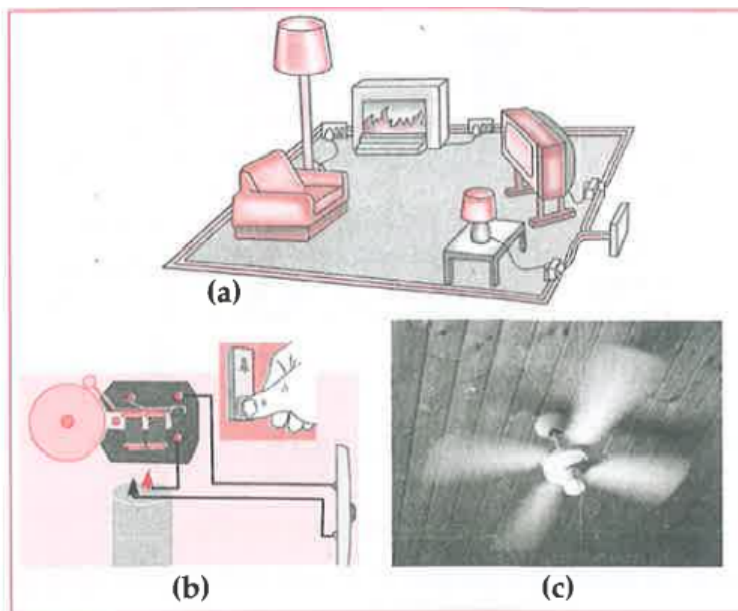


Fig 4.17



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124. The device which converts mechanical energy into electrical energy is called___

- A. elelectric charge
- B. electric generator
- C. electric fuse
- D. electric motor

Answer:



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125. The deflection of the pointer of _____ is on either side of zero mark A. Voltmeter B. Ammeter C. Galvanometer D. Thermometer

A. voltmeter

B. ammeter

C. galvanometer

D. thermometer

Answer:



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126. The device which converts mechanical energy into electrical energy is called ___



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127. State whether the following statements are true or false : The filament of electric bulb is made of a wire of low melting point.



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128. Find the odd word out

Loudspeaker, Microphone, Electric

motor, Magnet



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129. A cell is connected to a 9 ohm resistance, because of which heat of 400 J is produced per second due to current following through it. Obtain the potential difference applied across the resistance.





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130. Distinguish between :

Direct current and Alternating current.



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131. Write the definitions/laws:

Maxwell's cork screw rule:



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132. Name the following diagrams and explain the concept behind them

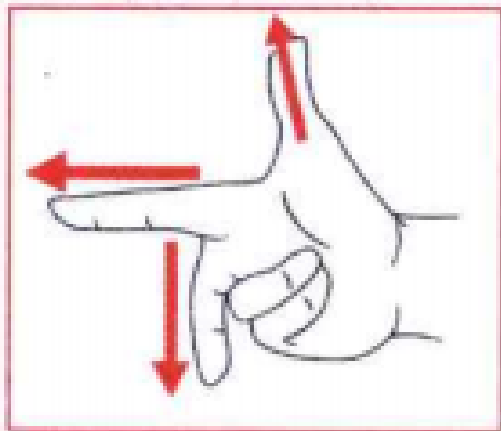


Fig 4.7



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133. An electric iron a power of 1100 W when set to higher temperature .If set to lower

temperature, it uses 330 W power. Find out the electric current and the respective resistance of 220 V.



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134. An electric tungsten bulb is connected into a home circuit. The home electric supply runs at 220 V potential difference. When switched on, a current of 0.45 A flows through the bulb. What must be power (wattage) of the

bulb? if it is kept on for 10 hours, how many units of electricity will be consumed?



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135. Derive joules Law with the help of a neat circuit diagram.



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