

## **Assignment - 2**

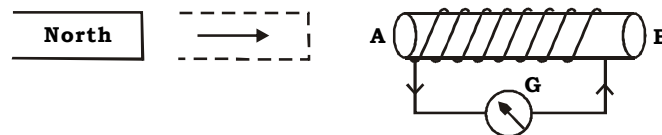
### **Board Papers & Numericals**

1. Current Electricity
2. Household Circuits
3. Electro Magnetism

Submission Date :   /   /

**Current Electricity, Household Circuits, Electro Magnetism (Board papers)**  
**Assignment Sheet**

1. Electric power  $P$  is given by the expression :  $P = (Q \times V) \div \text{time}$ 
  - (i) What do the symbols  $Q$  and  $V$  represent ?
  - (ii) Express power in terms of current and resistance explaining the symbols used therein. **[ICSE 2003]**
2. Which of the two wires of similar dimensions of copper or nichrome, would you use for the electric heater element ? Give reason to justify your answer. **[ICSE 2003]**
3. Two fuse wires of the same length are rated 5A and 20A. Which of the two fuse wires is thicker and why ? **[ICSE 2003]**
4. The diagram below shows a coil connected to a centre zero galvanometer  $G$ . The galvanometer shows a deflection to the right when the north pole of a powerful magnet is moved to the right as shown.
  - (i) Explain why the deflection occurs in the galvanometer ?
  - (ii) Does the direction of current in the coil appear clockwise or anticlockwise when viewed from end  $A$ .
  - (iii) State the observation in  $G$  when the coil moved away from  $N$ .
  - (iv) State the observation in  $G$  when both coil and magnet are moved to the right with the same speed. **[ICSE 2003]**



5. State the purpose of a fuse in an electric circuit. Name the material used for making a fuse wire. **[ICSE 2004]**
6. Draw a labelled diagram to show the various components of a step down transformer. **[ICSE2004]**
7. State the main difference between a step-up and a step down transformer. **[ICSE 2004]**
8. Explain how a magnet can be demagnetised using an alternating current. **[ICSE 2004]**
9. State two ways by which the e.m.f. of an a.c. generator can be increased. **[ICSE 2004]**

10. State the energy changes that take place when a magnet is moved inside a coil having a galvanometer at its ends. Name this phenomenon.

[ICSE 2005]

11. In a three pin plug, why is the earth pin made longer and thicker than other two pins.

[ICSE 2005]

12. (i) Draw a neat labelled diagram of an a.c. generator.

(ii) What is the magnitude of e.m.f. induced in the coil when its plane becomes parallel to the magnetic field.

[ICSE 2005]

13. State the function of split ring in a d.c. motor.

[ICSE 2005]

14. Mention two reasons why a soft iron core is used within the coil of a moving coil galvanometer.

[ICSE 2005]

15. State two advantages of an electromagnet over a permanent magnet.

[ICSE 2006]

16. State the factors that alter the resistance of a conductor.

[ICSE 2006]

17. Draw a labelled diagram of a three pin socket.

[ICSE 2006]

18. What will happen to a compass needle when the compass is placed below a wire and current is made to flow through the wire. Give a reason to justify your answer.

[ICSE 2006]

19. What energy conversion takes place during the working of a d.c. motor.

[ICSE 2006]

20. What is meant by earthing of an electrical appliance ? Why is it essential?

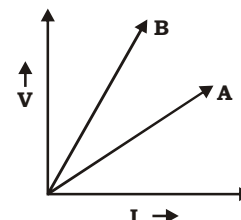
[ICSE 2007]

21. Of the three connecting wire in a household circuit:

(i) Which two of the three wires are at the same potential ?

(ii) In which of the three wires should the switch be connected ?

22. The V-I graph for a series combination of two resistance is shown in the figure. Which of the two, A or B, represents the parallel combination ? Give a reason for your answer. [ICSE 2007]



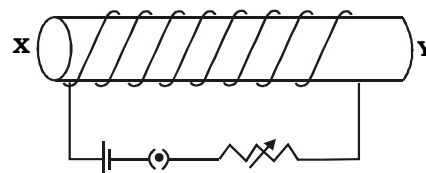
23. What will be the effect on the working of an electric bell if instead of a direct current, an alternating current is used.

[ICSE 2007]

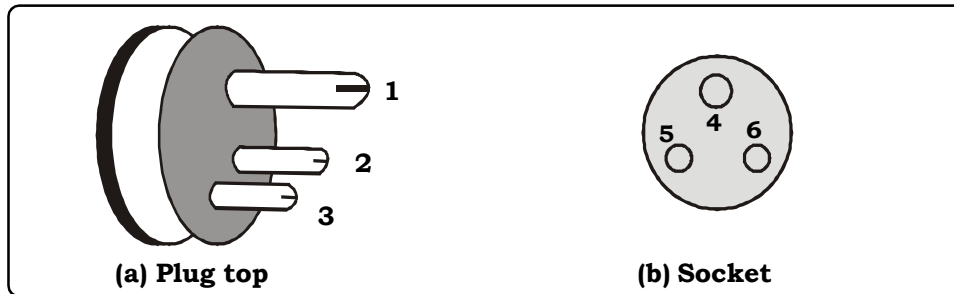
24. State two factors on which strength of a induced current depends.

[ICSE 2007]

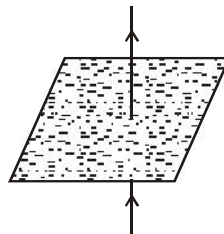
25. When a solenoid that is carrying current is freely suspended, it comes to rest along a particular direction. Why does it happen ? **[ICSE 2007]**
26. State one point of similarity and one point of difference between an a.c. generator and d.c. motor. **[ICSE 2008]**
27. (i) What is the name given to cylindrical coil whose diameter is less in comparison to its length ?  
 (ii) If a piece of soft iron is placed inside the current carrying coil, what is the name given to the device ?  
 (iii) Give one use of the device. **[ICSE 2008]**
28. Sketch a graph to show the change in potential difference across the ends of an ohmic resistor and the current flowing in it. Label the axes of your graph. What does the slope of the graph represents? **[ICSE 2008]**
29. The electrical gadgets used in a house such as bulb, fans, heater, etc. are always connected in parallel, not in series. Give two reasons of connecting them in parallel. **[ICSE 2008]**
30. How does heat produced in a wire or conductor depends upon the  
 (i) Current passing through the conductor.  
 (ii) resistance of the conductor. **[ICSE 2008]**
31. Why does a magnetic needle show a deflection when brought close to a current carrying conductor ? **[ICSE 2008]**
32. A wire bent into a circle carries current in anticlockwise direction. What polarity does this face of coil exhibit ? **[ICSE 2008]**
33. Draw a simple sketch of a step down transformer. Label the different parts in the diagram. **[ICSE 2008]**
34. The figure shows an electromagnet  
 (a) What will be the polarity at the end X ?  
 (b) Suggest a way by which the strength of the electromagnet referred to in the question, may be increased. **[ICSE 2009]**



37. The diagrams (i) and (ii) given below are of a plug and a socket with markings as 1, 2, 3 and 4,5,6 respectively on them. Identify and mark Live (L), Neutral (N) and Earth (E) against the correct number. **[ICSE 2009]**



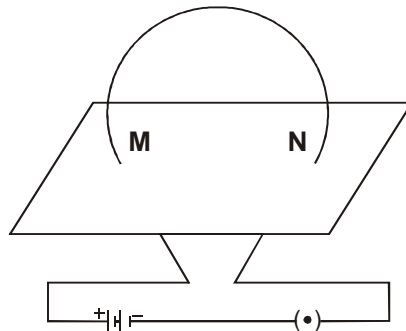
38. How does the heat produced in a wire or a conductor depend upon the :  
 (a) current passing through the conductor ?  
 (b) resistance of the conductor ? **[ICSE 2009]**
39. (a) State Ohms' law.  
 (b) Diagrammatically illustrate how you would connect a key, a battery, a voltmeter, an ammeter, an unknown resistance R and a rheostat so that it can be used to verify the above law. **[ICSE 2009]**
40. Give two differences between a d.c. motor and an a.c.generator. **[ICSE 2010]**
41. A device is used to transform 12V a.c. to 200 V a.c.  
 (i) What is the name of this device ?  
 (ii) Name the principle on which it works. **[ICSE 2010]**
42. (i) A straight wire conductor passes vertically through a piece of card board sprinkled with iron filings. Copy the diagram and show the setting of iron filings when a current is passed through the wire in the upward direction and the cardboard is tapped gently. Draw arrows to represent the direction of the magnetic field lines.



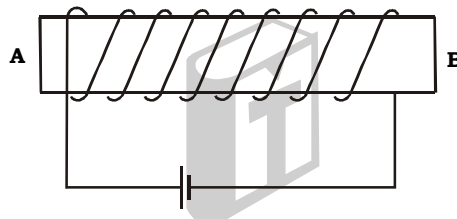
- (ii) Name the law which helped you to find the direction of the magnetic field lines. **[ICSE 2010]**
43. (i) A substance has nearly zero resistance at a temperature of 1 K. What is such a substance called ?  
 (ii) State any two factors which affect the resistance of a metallic wire. **[ICSE 2010]**

44. (i) Which part of an electrical appliance is earthed ?  
(ii) State a relation between electrical power, resistance and potential difference in an electrical circuit. **[ICSE 2010]**
45. (i) In what unit does the domestic electric meter measure the electrical energy consumed ? State the value of this unit in S.I. Unit.  
(ii) Why should switches always be connected to the live wire ?  
(iii) Give one precaution that should be taken while handling switches. **[ICSE 2010]**
46. (i) State two ways by which the magnetic field of a solenoid can be made stronger.  
(ii) What material is used for making the armature of a electric bell? Give a reason for using this material. **[ICSE 2010]**
47. (i) State two ways by which the magnetic field of a solenoid can be made stronger.  
(ii) What material is used for making the armature of a electric bell? Give a reason for using this material. **[ICSE 2010]**
48. (i) What is the colour code for the insulation on the earth wire?  
(ii) Write an expression for calculating electrical power in terms of current and resistance. **[ICSE 2011]**
49. (i) Name two safety devices which are connected to the live wire of a household electrical circuit.  
(ii) Give one important function of each of these two devices. **[ICSE 2011]**
50. (i) Draw a graph of Potential difference (V) versus Current (I) for an ohmic resistor.  
(ii) How can you find the resistance of the resistor from this graph?  
(iii) What is a non-ohmic resistor? **[ICSE 2011]**
51. (i) A cell is sending current in an external circuit. How does the terminal voltage compare with the e.m.f. of the cell?  
(ii) What is the purpose of using a fuse in an electrical circuit?  
(iii) What are the characteristic properties of fuse wire? **[ICSE 2012]**
52. (i) Write an expression for the electrical energy spent in the flow of current through an electrical appliance in terms of I, R and t.  
(ii) At what voltage is the alternating current supplied to our houses?  
(iii) How should the electric lamps in a building be connected? **[ICSE 2012]**
53. (i) What is an a.c. generator or Dynamo used for?  
(ii) Name the principle on which it works. **[ICSE 2012]**

54. The diagram below shows a current carrying loop or a circular coil passing through a sheet of cardboard at the points M and N. The sheet of cardboard is sprinkled uniformly with iron filings.

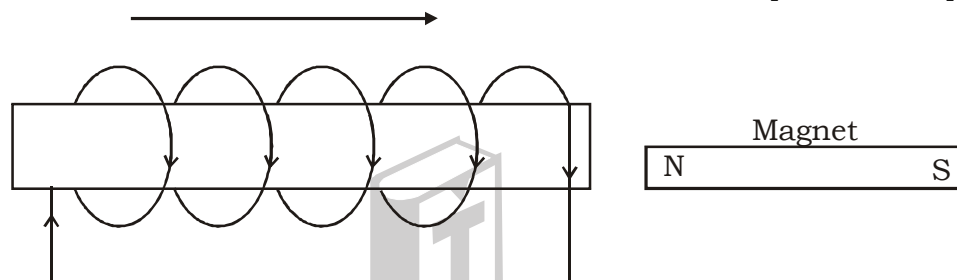


- (i) Copy the diagram and draw an arrow on the circular coil to show the direction of current flowing through it.  
 (ii) Draw the pattern of arrangement of the iron filings when current is passed through the loop. **[ICSE 2012]**
55. You have been provided with a solenoid AB
- (i) What is the polarity at end A  
 (ii) Give one advantage of electromagnet over a permanent magnet. **[ICSE 2013]**



56. (i) Name the device used to protect electric circuits from overloading & short circuit.  
 (ii) On what effect does the above device work. **[ICSE 2013]**
57. State Ohm's law. **[ICSE 2013]**
58. An electrical gadget can give an electric shock to the user under certain circumstances. Mention any two of these circumstances. **[ICSE 2013]**
59. What preventive measure provided in gadget can protect a person from electric shock. **[ICSE 2013]**
60. (i) Draw a simple labelled diagram of DC electric motor.  
 (ii) What is the function of split rings in a DC motor.  
 (iii) State one advantage of AC over DC. **[ICSE 2013]**
61. (i) What is consumed using different electrical appliances, for which electricity bills are paid?  
 (ii) Name a common device that uses electromagnets. **[ICSE 2014]**

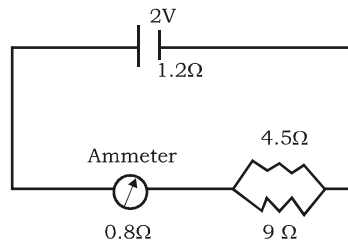
62. (i) What is an Ohmic resistor?  
 (ii) Two copper wires are of the same length, but one is thicker than the other.  
 1. Which wire will have more resistance?  
 2. Which wire will have more specific resistance? **[ICSE 2014]**
63. (i) Two sets A and B, of three bulbs each, are glowing in two separate rooms. when one of the bulbs in set A is fused, the other two bulbs also cease to glow. But in set B, when one bulb fuses, the other two bulbs continue to glow. Explain why this phenomenon occurs.  
 (ii) Why do we prefer arrangements of Set B for house circuiting? **[ICSE 2014]**
64. (i) Name two factors on which the magnitude of an induced e.m.f. in the secondary coil depends.  
 (ii) In the following diagram an arrow shows the motion of the coil towards the bar magnet.  
 1. State in which direction the current flows, A to B or B to A?  
 2. Name the law used to come to the conclusion. **[ICSE 2014]**



65. (i) What happens to the resistivity of semi-conductors with the increase of temperature?  
 (ii) For a fuse, higher the current rating \_\_\_\_ is the fuse wire. **[ICSE 2015]**
66. (i) Why does a current carrying, freely suspended solenoid rest along a particular direction?  
 (ii) State the direction in which it rests. **[ICSE 2015]**
67. Give two similarities between an A.C. generator and a D.C. motor. **[ICSE 2015]**
68. (i) Name the device used to increase the voltage at a generating station.  
 (ii) At what frequency is A.C. supplied to residential houses?  
 (iii) Name the wire in a household electrical circuit to which the switch is connected. **[ICSE 2015]**
69. The relationship between the potential difference and the current in a conductor is stated in the form of a law.  
 (i) Name the law.  
 (ii) What does the slope of V-I graph for a conductor represent?  
 (iii) Name the material used for making the connecting wire. **[ICSE 2015]**



70. A cell of Emf 2V and internal resistance  $1.2\ \Omega$  is connected with an ammeter of resistance  $0.8\ \Omega$  and two resistors of  $4.5\ \Omega$  and  $9\ \Omega$  as shown in the diagram below :

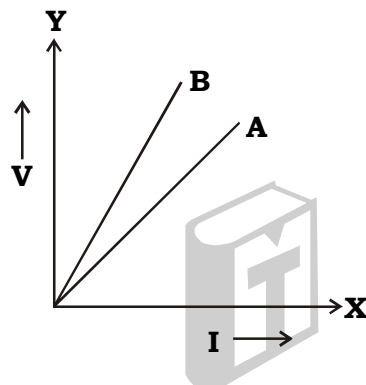


- (i) What would be the reading on the Ammeter?  
 (ii) What is the potential difference across the terminals of the cell?

**[ICSE 2015]**

71. The V-I graph for a series combination and for a parallel combination of two resistors is shown in the figure below. Which of the two A or B represents the parallel combination? Give reasons for your answer.

**[ICSE 2016]**



72. State the characteristics required in a material to be used as an effective fuse wire.

**[ICSE 2016]**

73. Which coil of a step up transformer is made thicker and why?

**[ICSE 2016]**

74. (i) Which particles are responsible for current in conductors?  
 (ii) To which wire of a cable in a power circuit should the metal case of a geyser be connected?  
 (iii) To which wire should the fuse be connected?

**[ICSE 2016]**

75. (i) Name the transformer used in the power transmitting station of a power plant.

(ii) What type of current is transmitted from the power station?

(iii) At what voltage is this current available to our household?

**[ICSE 2016]**

76. Define specific resistance and state its SI unit. **[ICSE 2017]**
77. Which particles are responsible for current in conductors?  
**[ICSE 2017]**
78. To which wire of a cable in a power circuit should the metal case of a geyser be connected?  
**[ICSE 2017]**
79. To which wire should the fuse be connected? **[ICSE 2017]**
80. Explain the meaning of the statement 'current rating of a fuse is 5A'.  
**[ICSE 2017]**
81. In the transmission of power the voltage of power generated at the generating stations is stepped up from 11 kV to 132kV before it is transmitted. Why?  
**[ICSE 2017]**
82. State two causes of energy loss in a transformer. **[ICSE 2017]**

