

SCIENCE
WORKSHEET_110725
CHAPTER 04 ELECTRICITY: MAGNETIC AND HEATING EFFECTS

SUBJECT: SCIENCE

MAX. MARKS : 40

CLASS : VIII

DURATION : 1½ hrs

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 20 questions divided into five Sections A, B, C, D and E.
- (iii). **Section A** comprises of 10 MCQs of 1 mark each. **Section B** comprises of 4 questions of 2 marks each. **Section C** comprises of 3 questions of 3 marks each. **Section D** comprises of 1 question of 5 marks each and **Section E** comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.
- (v). **Use of Calculators is not permitted**

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. What is the phenomenon called when electric current flowing through a conductor produces a magnetic field around it?
(a) Heating effect of electric current (b) Magnetic effect of electric current
(c) Chemical effect of electric current (d) Physical effect of electric current
2. A student observes that a cylindrical coil of insulated wire connected to a cell behaves like a magnet. What is this current-carrying coil known as?
(a) A permanent magnet (b) A solenoid
(c) An electromagnet (d) A circuit breaker
3. Which of the following would make an electromagnet with the greatest strength?
(a) A coil with a few turns and a single cell.
(b) A coil with a large number of turns and a battery of 2 cells.
(c) A coil with a few turns and a battery of 2 cells.
(d) A coil with a large number of turns and a single cell.
4. The first battery was invented after a scientist discovered that electric current was generated by the combination of metals and a liquid. Who was this scientist?
(a) Luigi Galvani (b) Hans Christian Oersted (c) Thomas Edison (d) Alessandro Volta
5. An electric kettle works on the principle of:
(a) Magnetic effect of electric current (b) Chemical effect of electric current
(c) Heating effect of electric current (d) Light effect of electric current
6. What is the main difference between a dry cell and a Voltaic cell?
(a) A dry cell uses a liquid electrolyte, while a Voltaic cell uses a paste-like electrolyte.
(b) A dry cell is rechargeable, while a Voltaic cell is not.
(c) A dry cell is more portable because its electrolyte is a moist paste, not a liquid.
(d) A dry cell contains two electrodes, while a Voltaic cell has only one.
7. Which of the following is NOT an application of the magnetic effect of electric current?
(a) Electric fan (b) Loudspeaker (c) Electric bell (d) Electric stove
8. What is a key advantage of rechargeable batteries over single-use cells?
(a) They are made of more common materials.

- (b) They prevent wastage and save money over time.
- (c) They are much safer to dispose of in regular garbage.
- (d) They can only be used in large devices like cars.

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

9. Assertion (A): When a Voltaic cell is used for a long time, it becomes 'dead'.

Reason (R): The chemical substances inside the cell get used up over time.

10. Assertion (A): Nichrome wire is used as a heating element in many electrical appliances.

Reason (R): Nichrome offers high resistance and converts a significant amount of electrical energy into heat energy.

SECTION – B

Questions 11 to 14 carry 2 marks each.

- 11.** Why does a current-carrying wire get warm? Explain the underlying principle.
- 12.** What are the two ways to change the strength of an electromagnet?
- 13.** How are electromagnets used in scrap yards and factories?
- 14.** What is a Voltaic cell? Who are the two scientists after whom it is named, and what were their contributions?

SECTION – C

Questions 15 to 17 carry 3 marks each.

- 15.** Why is it said that "the Earth itself behaves like a giant magnet"? What is the cause of this phenomenon?
- 16.** Describe the key components of a dry cell and state its main disadvantage.
- 17.** Explain the safety measures related to the heating effect of electric current in household circuits.

SECTION – D

Questions 18 carry 5 marks each.

- 18.** Describe an experiment to demonstrate the magnetic effect of electric current. Explain your observations and conclusion.

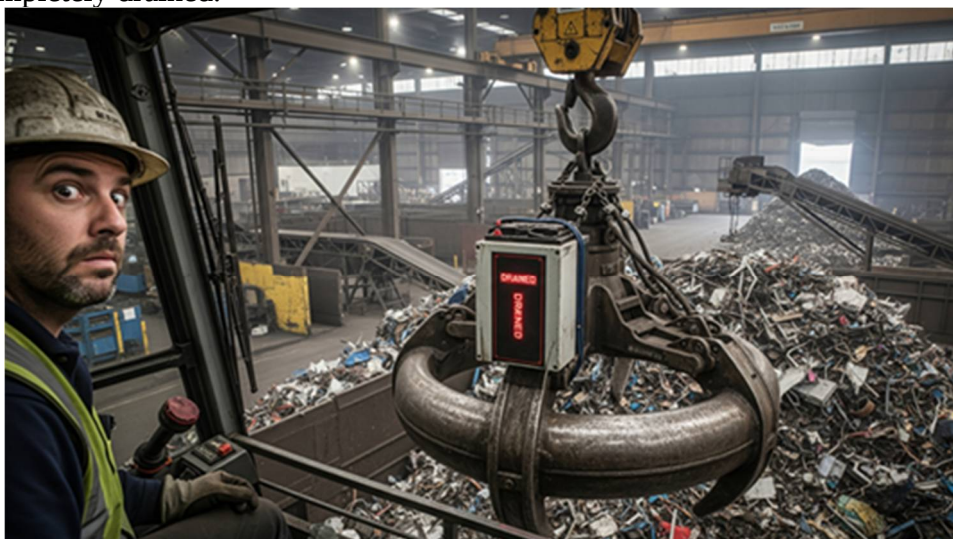
SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study-1: The Metal Recycling Plant

In a large industrial recycling plant, an operator, Rohan, uses a massive crane with an electromagnet to move scrap steel. The crane's electromagnet is connected to a powerful battery. Rohan knows that to lift heavier loads, he needs to increase the strength of the electromagnet. He also knows that changing the direction of the current can reverse the poles of the magnet. On a particular day, the crane operator notices that the electromagnet has stopped working even though

the circuit is closed. Upon investigation, he finds that the battery has been overused and has become completely drained.



- (i) What is the relationship between the battery and the strength of the electromagnet? [1]
- (ii) What would happen if Rohan reversed the battery terminals while the electromagnet was working? [1]
- (iii) Why did the electromagnet stop working when the battery became drained? [1]
- (iv) What kind of metals can this electromagnet lift? [1]

20. Case Study-2: The Electric Stove Dilemma

Sana is trying to heat water using an electric stove. She notices that the coil on the stove, called the heating element, glows red hot when she switches it on. She has a choice of two different heating elements: one made of copper and another of nichrome, both of the same size and length. She recalls from her science class that both are conductors, but their properties are different. She selects the nichrome element, and the water heats up quickly.



- (i) Why does the heating element glow red hot? [1]
- (ii) Why is nichrome a better choice for a heating element than copper? [1]
- (iii) What would happen if Sana used a thinner nichrome wire instead of a thicker one (assuming the length is the same)? [1]
- (iv) Give one example of an appliance other than a stove that uses a heating element. [1]

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