

SCIENCE
WORKSHEET_210526
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. The discovery that electricity and magnetism are linked was made by which scientist?
(a) Alessandro Volta (b) Luigi Galvani (c) Hans Christian Oersted (d) Thomas Edison
2. What is a coil of wire with an iron core, which behaves like a magnet when electric current flows through it, known as?
(a) A permanent magnet (b) An insulator (c) An electromagnet (d) A generator
3. Which of the following describes the key principle behind the working of a Voltaic cell?
(a) Magnetic effect of electric current
(b) Heating effect of electric current
(c) Chemical reactions between electrodes and electrolyte
(d) The use of a dry paste instead of a liquid
4. What is the purpose of a heating element in an electric stove?
(a) To increase the flow of current. (b) To convert electrical energy into heat energy.
(c) To act as a switch for the circuit. (d) To generate a magnetic field.
5. An electromagnet's poles can be reversed by:
(a) Increasing the number of turns of the coil.
(b) Inserting a plastic core instead of an iron core.
(c) Changing the direction of the electric current.
(d) Reducing the voltage of the cell.
6. What material is typically used to create a strong electromagnet core for practical applications?
(a) Copper (b) Iron (c) Plastic (d) Wood
7. Why should you not touch a nichrome wire for an extended period after current has passed through it?
(a) It becomes a strong magnet. (b) It becomes very cold.
(c) It becomes warm due to the heating effect. (d) The magnetic field will cause a shock.
8. A Voltaic cell's electrodes are made of:
(a) Two different metals (b) Plastic and glass
(c) Copper only (d) Nichrome wire

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): All batteries can be recharged and reused.

Reason (R): Dry cells are a type of rechargeable battery.

10. Assertion (A): The Earth behaves like a giant magnet.

Reason (R): The magnetic field of the Earth is caused by the movement of liquid iron in its core.

SECTION – B

Questions 11 to 14 carry 2 marks each.

- 11.** What is the heating effect of electric current? Give one example of an industrial application of this effect.
- 12.** How does a Voltaic cell become 'dead'?
- 13.** Give two reasons why rechargeable batteries are increasingly being used today.
- 14.** What happens when a current-carrying wire is placed under a magnetic compass? What does this observation indicate?

SECTION – C

Questions 15 to 17 carry 3 marks each.

- 15.** What is the difference between an electromagnet and a permanent magnet based on the information provided in the chapter?
- 16.** How is a Voltaic cell constructed using a lemon? What are the key components and their functions in this setup?
- 17.** Explain the importance of the Earth's magnetic field for life on Earth.

SECTION – D

Questions 18 carry 5 marks each.

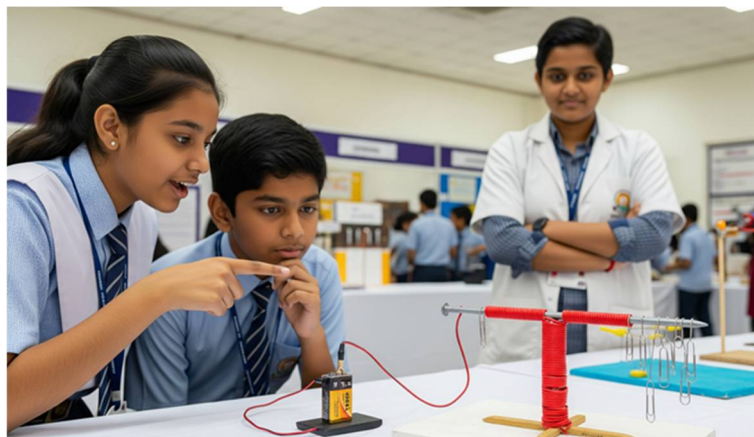
- 18.** Describe the heating effect of electric current. Discuss the factors that influence the amount of heat generated in a conductor and explain how this effect is utilized in common household appliances.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study-1: The Science Fair Project

Mohini and Aakarsh were fascinated by their senior Sumana's lifting electromagnet model at a science exhibition. The model consisted of an iron nail wrapped with an insulated wire connected to a battery. When the circuit was closed, the nail picked up iron paper clips. When the circuit was opened, the clips fell off. They wondered why the nail acted like a magnet only when the current was flowing. They remembered learning that iron is a magnetic material attracted to magnets, but in this model, there was no magnet.



- (i) What scientific principle is being demonstrated by Sumana's model? [1]
- (ii) What is the function of the iron nail in the electromagnet? [1]
- (iii) What would happen if Sumana used a plastic nail instead of an iron one? [1]
- (iv) Why is it important to use an insulated wire for this activity? [1]

20. Case Study-2: The Dead Battery Mystery

Ankit's remote-controlled car stopped working. He checked the batteries and found that they felt slightly warm, but the car was not moving. He realized that the batteries, which were dry cells, had been used for a long time and were now 'dead.' His friend, Rita, explained that even though they are 'dead,' they should not be thrown in the regular garbage because they can be harmful to the environment. She suggested taking them to a special recycling facility.



- (i) Why did the batteries feel warm even though they were 'dead'? [1]
- (ii) What is the main reason a dry cell becomes 'dead'? [1]
- (iii) Why did Rita suggest not throwing the batteries in regular garbage? [1]
- (iv) What kind of materials are found in batteries that make them valuable for recycling? [1]

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