



Attempt questions first; check the separate key afterward. Show all working. Draw accurate figures where required.

A. Very short answers - 1 mark each

1. What is required for a simple circuit to carry current continuously?
2. Draw a cell-switch-bulb circuit with standard symbols.
3. Name the effect of current used in an electric heater.
4. Name the effect used in an electromagnet.
5. Does a compass needle deflect near a current-carrying wire?
6. Describe an experiment demonstrating this effect.
7. What happens to the compass deflection when current direction reverses?
8. Explain what this suggests about the magnetic field.

B. Short answers / practice - 2 marks each

9. Name a suitable core for a temporary electromagnet.
10. State two ways to make the electromagnet stronger.
11. Does an electromagnet normally retain strong magnetism after switching off?
12. Compare electromagnets and permanent magnets.
13. What happens when excessive current melts a fuse?
14. Explain why a fuse must not be replaced with arbitrary thick wire.
15. Which effect of current makes an incandescent bulb filament glow?
16. Why do many modern lamps use LEDs instead?
17. Can an open switch stop current in a simple series circuit?
18. Draw open and closed circuit diagrams.
19. Name a device that uses an electromagnet to move a striker.
20. Explain the make-and-break action in an electric bell.

C. Application / reasoning - 3 marks each

21. A wire coil has 20 turns; another similar coil has 40. At equal current, which generally gives a stronger field?
22. State the conditions that must be controlled for a fair comparison.
23. Does a thicker fuse wire necessarily provide the same protection as the correct fuse?
24. Explain overloading in a household circuit.
25. A 5 W lamp works for 2 h. Find energy in watt-hours.
26. Find energy used by four such lamps for 2 h.
27. An LED lamp uses 8 W for 5 h. Find energy consumed in Wh.
28. Explain why a low-voltage cell is preferable to mains supply for classroom circuit experiments.
29. Does doubling the number of turns always guarantee doubled electromagnet strength in every setup?
30. Predict what happens to an electromagnet's poles when its battery connections are reversed.
31. Draw a circuit with a switch controlling an electromagnet and label all parts.

D. Extended practice - 5 marks per pair

32. Is it safe to handle a damaged mains wire with wet hands?
33. State three safe practices for using household electrical appliances.
34. What happens to a series circuit if one connecting wire breaks?
35. Design a low-voltage electromagnet experiment, including materials, method, observations and precautions.

ANSWER KEY - Numerical / closed questions

- 1) A closed conducting path and source. 3) Heating effect. 4) Magnetic effect. 5) Yes. 7) Deflection direction reverses. 9) Soft iron. 11) No. 13) Circuit breaks. 15) Heating. 17) Yes. 19) Electric bell. 21) The 40-turn coil. 23) No. 25) 10 Wh. 26) 40 Wh. 27) 40 Wh. 29) No; other factors matter. 30) Poles interchange. 32) No. 34) Current stops throughout.