



Unit 11 • Electricity and Magnetism: induction, generators and transformers

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 33

1 Key words

[4]

Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

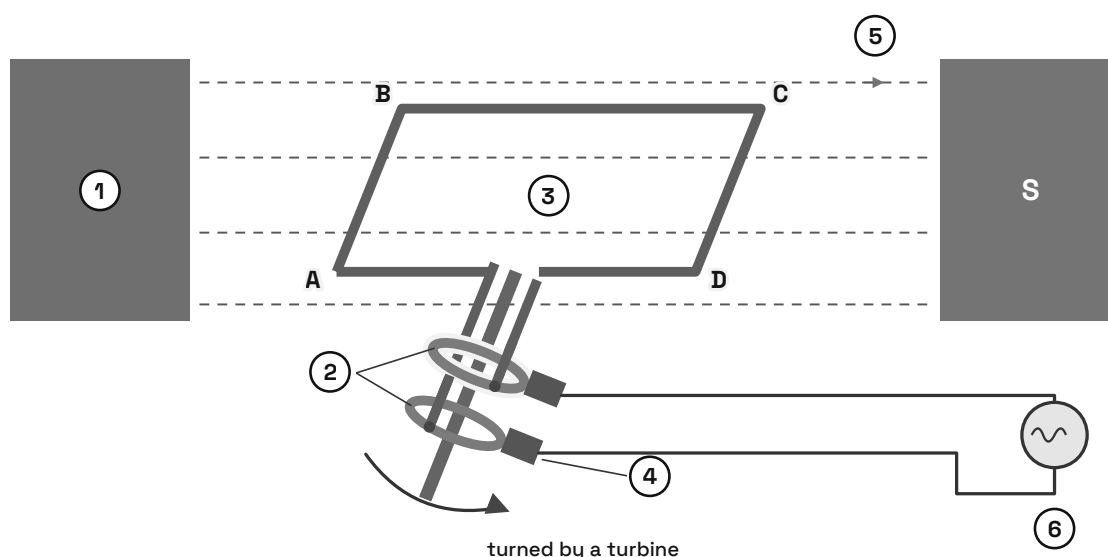
electromagnetic induction Faraday flux lamination motor effect mutual induction
rectifier slip rings step-up transformer

The total number of magnetic lines of force passing through a surface is the magnetic _____ through it. The production of an e.m.f. in a conductor when the magnetic flux linked with it changes is called _____. It was discovered by _____ in 1831. In a generator, the coil is joined to the outside circuit through two _____ and carbon brushes. A device that increases or decreases the voltage of alternating current is a _____. It works on the principle of _____. A transformer whose secondary coil has more turns than its primary is a _____ transformer. Its core is made of thin, insulated iron sheets; this is called _____.

2 Label the diagram

[3]

The diagram shows a simple a.c. generator. Name the parts numbered 1 to 6. Each carries 0.5 mark.



- | | |
|----------|----------|
| 1. _____ | 2. _____ |
| 3. _____ | 4. _____ |
| 5. _____ | 6. _____ |



3 Multiple choice [5]

Choose the correct option for each of the following questions.

- i. On which principle does a transformer work? [1]
a. electromagnetic induction b. mutual induction
c. motor effect d. lighting effect of current
- ii. Which is the transformer formula? [1]
a. $V_p/V_s = N_s/N_p$ b. $V_s/N_p = N_s/V_p$
c. $V_s/V_p = N_p/N_s$ d. $V_s/N_s = V_p/N_p$
- iii. A magnet sits still inside a coil connected to a galvanometer. What does the meter show? [1]
a. a large current, because the magnet is inside
b. a small steady current
c. zero
d. a current that keeps reversing
- iv. A bicycle's dynamo lamp gets brighter as you ride faster. Why? [1]
a. friction heats the lamp more
b. the magnet spins faster, so the flux changes faster and a larger voltage is induced
c. the battery in the dynamo is charged more
d. the tyre makes static electricity
- v. In which device is a step-up transformer used? [1]
a. a mobile phone charger b. a microwave oven
c. a doorbell d. a pole transformer near a house

4 Very short answers [3]

Write very short answers to the following questions.

- a. Write the SI unit of magnetic flux. [1]

- b. Which energy is changed into electrical energy in a generator? [1]

- c. Why can't a transformer change the voltage of d.c.? [1]

5 Short answers [6]

Write short answers to the following questions.

- a. State Faraday's law of electromagnetic induction. [2]



[2]

[2]

[4]

Write a long answer to the following question.

A bar magnet is moved into and out of a solenoid connected to a galvanometer. What happens to the needle of the galvanometer, and why,

- as the magnet is slowly pushed into the solenoid;
- as it is pushed in rapidly;
- when it is held still inside;
- when it is pulled quickly out?

[6]

Solve the following problems. Show your working.

- [2]

[illegible]

Answer:

- [4]



