

MULTIPLE CHOICE QUESTIONS

Choose the correct answer from the following choices:

- i. **Which statement is true about the magnetic poles?**
 - a) unlike poles repel
 - b) like poles attract
 - c) magnetic poles do not affect each other
 - d) a single magnetic pole does not exist

- ii. **What is the direction of the magnetic field lines inside a bar magnet?**
 - a) from north pole to south pole
 - b) from south pole to north pole
 - c) from side to side
 - d) there are no magnetic field lines

- iii. **The presence of a magnetic field can be detected by a:**
 - a) small mass
 - b) stationary positive charge
 - c) stationary negative charge
 - d) magnetic compass

- iv. **If the current in a wire which is placed in a magnetic field increases, the force on the wire:**
 - a) increases
 - b) decrease
 - c) remains the same

- d) will be zero
- v. **A D.C. motor converts:**
- a) mechanical energy into electrical energy
 - b) mechanical energy into chemical energy
 - c) electrical energy into mechanical energy
 - d) electrical energy into chemical energy
- vi. **Which part of a D.C. motor reverses the direction of current through the coil every half-cycle?**
- a) the armature
 - b) the commutator
 - c) the brushes
 - d) the slip rings
- vii. **The direction of induced e.m.f. in a circuit is in accordance with conservation of:**
- a) mass
 - b) charge
 - c) momentum
 - d) energy
- viii. **The step-up transformer:**
- a) increases the input current
 - b) increases the input voltage
 - c) has more turns in the primary
 - d) has less turns in the secondary coil

ix. The turn ratio of a transformer is 10. It means:

- a) $I_s = 10 I_p$
- b) $N_s = N_p / 10$
- c) $N_s = 10 N_p$
- d) $V_s = V_p / 10$

ANSWERS

- | | | | | |
|-------|--------|---------|-------|------|
| i. d | ii. b | iii. d | iv. a | v. c |
| vi. d | vii. D | viii. b | ix. c | |

REVIEW QUESTIONS

[Note: Please see the answer of these question in the topics]

CONCEPTUAL QUESTIONS

15.1 Suppose someone? handed you three similar iron bars and told you one was not magnet but the other two were. How would you find the iron bar that was not magnet?

Answer

We shall place the compass near each of the iron bar and will identify the magnetic nature of these iron bars. The iron bar which is not the magnet will not cause any deflection of the needle in the compass.

15.2 Suppose you have a coil of wire and a bar magnet. Describe how you could use them to generate an electric current.

Answer

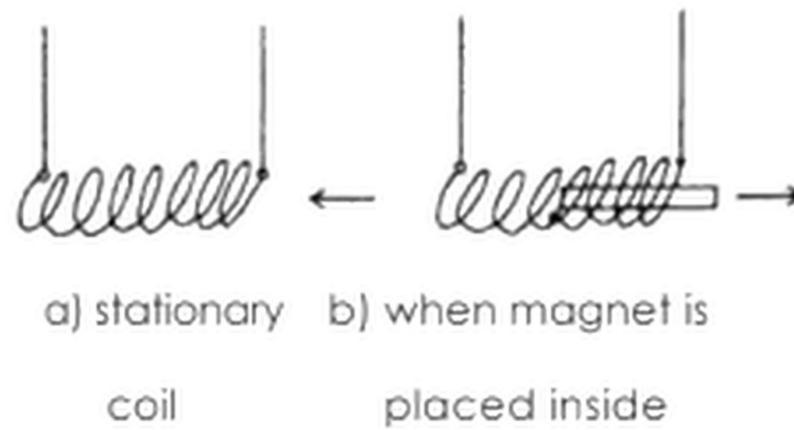
By moving the bar magnet towards the coil or by moving the coil towards the stationary magnet, the induced e.m.f. and induced current as well can be produced in the coil. This induced current will produce due change in the magnetic flux through the coil.

15.3 Which device is used for converting electrical energy into mechanical energy?

Answer

Electric motor is used to convert electrical energy into mechanical energy.

15.4 Suppose we hang a loop of wire so that it can swing easily. If we now put a magnet into the coil, the coil will start swinging. Which way will it swing relative to the magnet and why?

**Answer**

The coil will swing perpendicular to its cross-sectional area due to opposite polarity of magnet and coil according to Lenz's law.

15.5 A conductor wire generates a voltage while moving through a magnetic field. In what direction should the wire be moved, relative to the field to generate the maximum voltage?

Answer

The conductor wire should move perpendicular to the direction of magnetic field (lines) to produce a maximum (induced) voltage in it according to right hand rule.

15.6 What is the difference between a generator and a motor?

Answer

- 1) Generator converts mechanical energy into electrical energy.
- 2) Motor converts electrical energy into mechanical energy.

15.7 What reverses the direction of electric current in the armature coil of D.C. motor?

Answer

In case of D.C motor the direction of electric current is reversed due to split rings. (For detail please see the topic.)

15.8 A wire lying perpendicular to an external magnetic field carries of a current in the direction shown in the diagram below. In what direction will the wire move due to the resulting magnetic force?

Answer

By applying right hand rule the wire will move down perpendicular to the direction of magnetic field and current.

15.9 Can a transformer operate on direct current?

Answer

No, a transformer can operate only on Alternating Current (A.C), because it operates on the principal of mutual induction which is obtained prominently in A.C. supply.

