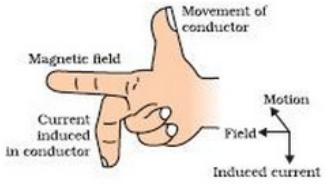
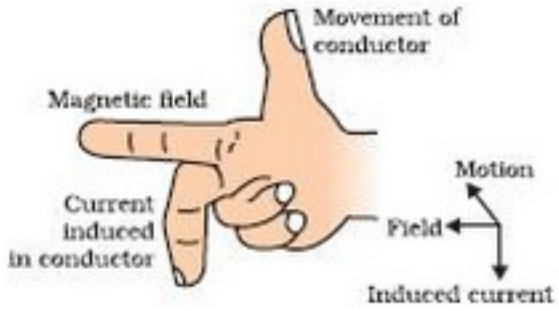
PAGE 102:

Q1.
Electric Generator.
Q2.
(a) D.C. Generator.
(b) A.C. Generator.
Q3.
Electromagnetic Induction.
Q4.
Fleming's Right Hand Rule.
Q5.
The condition necessary for the production of current by electromagnetic induction is that there must be a relative motion between the wire and the magnet.
Q6.
AC Generator (or Alternator).
Q7.
If we replace the slip rings of an AC generator by a commutator, then it will become a DC generator.
Q8.
(a) True
(b) False
Q9.
Function of brushes is to transfer the current from coil to load.
Q10.
This phenomena is known as electromagnetic induction.
Q11.
Electromagnetic induction
Q12.
Simple alternator - Magnet fixed and coil rotates;
Practical alternator - Coil fixed and magnet rotates.
Q13.
To obtain water for making steam for turning turbines and for cooling spent steam to condense it back into hot water for making fresh steam.
Q14.
Electromagnet, permanent magnet, wire carrying current.
Q15.
Direct.
Q16.
Yes, some current will be induced in the coil B because of change in magnetic field through the coil B due to change in current in coil A. This is called electromagnetic induction.
Q17.
(a) Electric generator is based on the principle that when a straight conductor is moved in a magnetic field, then current is induced in the conductor.
(b) Two ways in which the current induced in the coil of a generator could be increased are:
(i) by roating the coil faster.
(ii) by using a coil with a larger area.
Q18.
(a) The difference between AC and DC is that DC flows in one direction only while AC reverses direction after equal intervals of

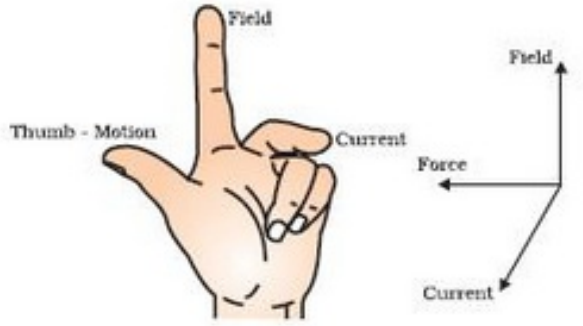
time.
(i) DC current remains same with time in its value and direction.
(ii) AC current changes with time and changes its direction every time after a certain interval of time.
(b)
(i) DC
(ii) AC
Q19.
The direction of induced current produced in a straight conductor moving in a magnetic field is given by Fleming's right hand rule. According to Fleming's right hand rule : Hold the thumb, the fore finger and the centre finger of your right-hand at right angles to one another. Adjust your hand in such a way that forefinger points in the direction of magnetic field, and thumb points in the direction of motion of conductor, then the direction in which centre finger points, gives the direction of induced current in the conductor.



Q20.
(a) Fleming's right hand rule: Hold the thumb, the fore finger and the centre finger of your right-hand at right angles to one another. Adjust your hand in such a way that forefinger points in the direction of magnetic field, and thumb points in the direction of motion of conductor, then the direction in which centre finger points, gives the direction of induced current in the conductor.

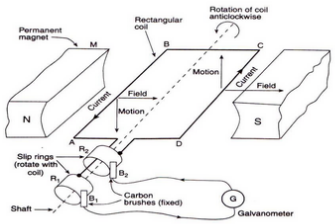


(b) Fleming's left hand rule: Hold the forefinger, the centre finger and the thumb of your left hand at right angle to one another. Adjust your hand in such a way that the forefinger points in the direction of magnetic field and the and centre finger points in the direction of current, then the direction in which thumb points, gives the direction of force acting on the conductor.



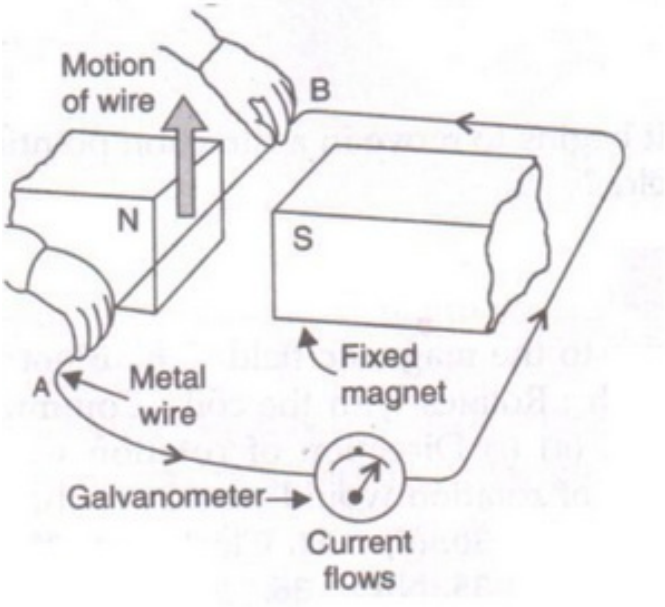
Q21.
(a) Construction-wise, the only difference between a D.C. generator

and an A.C. generator is in the way the two ends of the generator coil are linked to the outer circuit. In a D.C. generator we connect the two ends of the coil to a commutator consisting of two half rings of copper. In an A.C. generator we connect the two ends of the coil to two full rings of copper called slip rings. There is no commutator in an A.C. generator.
(b) Generally, the alternators in a Thermal Power Station are driven by the power of high pressure steam.
To heat water in the boiler, fuels like coal or natural gas can be used.
Q22.



Construction:
A simple AC generator consists of a rectangular coil ABCD which can be rotated rapidly between the poles N and S of a strong horseshoe-type permanent magnet M. The coil is made of a large number of turns of insulated copper wire. The two ends A and D of the coil are connected to two circular pieces of copper metal called slip rings R_1 and R_2. As the slip rings rotate with the coil, the two fixed pieces of carbon called brushes, B_1 and B_2, keep contact with them. So, the current produced in the rotating coil can be tapped out through slip rings into the carbon brushes. The outer ends of carbon brushes are connected to a galvanometer to show the flow of current in the external circuit.
Working:
Suppose the coil ABCD, which is initially in the horizontal position, is rotated in the anticlockwise direction. The side AB of the coil moves down and side CD moves up. Due to this, induced current is produced in both the sides, which flows in the direction BADC (according to Fleming's right hand rule). Thus, in the first half rotation, the current in the external circuit flows from brush B_1 to B_2. After half revolution, sides AB and CD will interchange their positions. So, side AB starts moving up and side CD starts moving down. As a result, direction of induced current in the coil is reversed and flows in the direction CDAB. The current in the external circuit flows from brush B_2 to B_1.

Q23.
(a) The production of electricity from magnetism is known as electromagnetic induction.
Let us move a wire AB upward rapidly between the poles of the horseshoe magnet. When the wire is moved up, there is a deflection in the galvanometer pointer which shows a current is produced in the wire AB momentarily. Thus, as the wire is moved up through the magnetic field, an electric current is produced in it.



(b) Electric generator.
(c) Different ways to induce current in a coil of wire are:
(i) by moving the coil relative to a fixed magnet
(ii) by keeping the coil fixed and moving a magnet relative to it.
Q24.
(a) If the current flows in one direction only, it is known as direct current; and if the current reverses direction after equal intervals of time, it is called alternating current.
(b) Source of DC are dry cell, car battery, DC generator etc.
Source of AC are AC generator, bicycle dynamos etc.
(c) An important advantage of AC over DC is that AC can be transmitted over long distances without much loss of electrical

energy.
(d) 50Hz.

PAGE 105:

Q37.
(a) The galvanometer deflects to the left.
(b) The galvanometer deflects to the left.
(c) No deflection in galvanometer.
The deflection in the galvanometer can be increased by
i. increasing the number of turns in the coil
i. using a strong magnet
ii. increasing the speed with which magnet is moved in the coil.
Q38.
(i) Electromagnetic induction.
(ii) The galvanometer gives a reading to the left.
(iii) Large deflection to right occurs more quickly.
Q39.
Relative motion between the coil and the magnet.
Q40.
(a) Current increased.
(b) Current reversed.
(c) Current increased.
(d) Zero current.
(e) Zero current.
Q41.
(i) Galvanometer pointer moves to one side showing that a momentary current is induced in the coil A.
(ii) Galvanometer pointer moves to the other side showing that the direction of momentarily induced current has been reversed.
The phenomenon taking place here is electromagnetic induction. When the current is passed through coil B or is stopped, the magnetic field linked with coil A changes due to which an induced current is produced in the coil.
Q42.
Step-down transformer (which reduces the voltage).

********** END **********