1601012210 9 Aakriti Mehta
C2-2, IA-2
Aakriti

Page No. 1
Date

EEEE IA-2

Q1) Switchgear describes a wide variety of switching devices that all fullfill a common need: controlling, protecting and isolating power systems. It can be extended to include devices to regulate and meter a power system, circuit breakers and similar technology. There are three different classes of switchgears system: low voltage, medium voltage, high voltage. High voltage switchgears are those that control 75kV of power or more. Because these breakers are designed for high voltage they often include improved safety features.

Fuse is also a protective device meant to protect electrical appliances from high voltage and short circuits. In event of any possible damage, the fuse wire melts and disconnects the circuit from the supply to prevent damage. Fuses of capacity 5A or 15A are commonly used in domestic electrical fittings.

MCB. is miniature circuit breakers. MCB is an electrical switch which is self-operating and is needed as a protection to human beings and ~~under~~ electrical appliances from electrical shocks caused by current overload or short circuits. Under normal working conditions, a rated amount of current flows through an electrical network. Type B MCBs is most sensistive type and used in domestic ~~pup~~purposes.

Aakriti Mehta
Aakriti IA-2
C2-2
16010122109

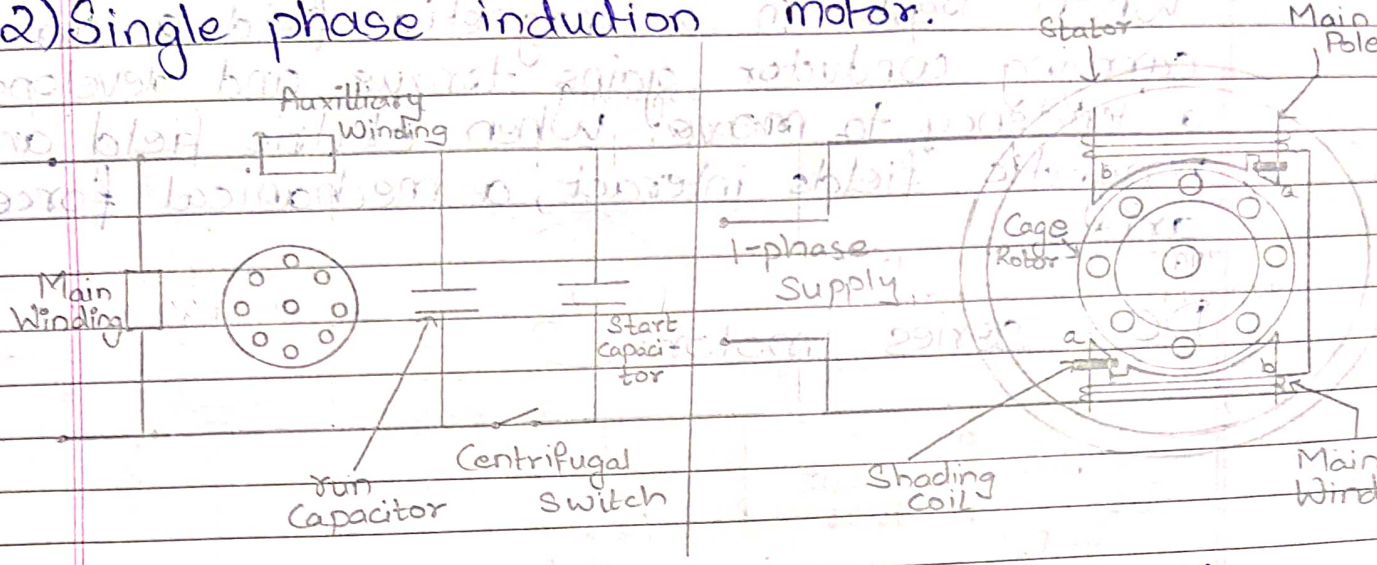
ELCB is earth-leakage circuit breakers. It is a safety device used in electrical installations with high Earth impedance to prevent shock. It detects small stray voltages on metal enclosures of electrical equipement and interrupts the circuit if a dangerous voltage is detected.

CFL is compact fluorescent lamp or compact fluorescent light. It is energy-saving light and compact fluorescent tube, is a fluorescent lamp designed to replace an incandescent light bulb. Some types fit into light fixtures designed for incandescent bulbs. It provides relatively shawdow free lighting.

LED lamp is an electric light that produces light using light emitting diodes. LED lamps are significantly more energy efficient than equivalent incandescent lamps and can be significantly more efficient than most of the fluorescent lamps. The most effective commercially available LED lamps have efficiencies of 200 lumen per watt. Commercial LED lamps have a lifespan many times longer than incandescent lamps.

Aakriti Mehta
Cakriti
16010122109
C2-2, IA-2

2) Single phase induction motor.

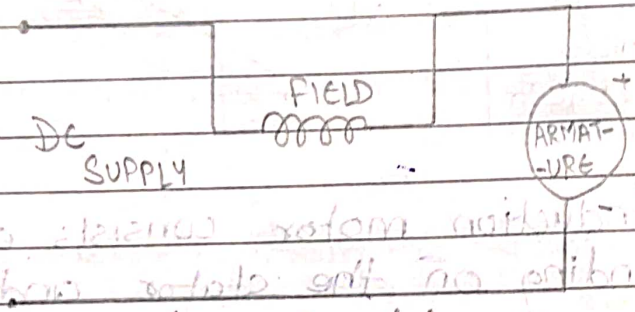


- A single phase induction motor consists of a single phase winding on the stator and a cage winding on the rotor. When a 1 phase supply is connected to the stator winding, a pulsating magnetic field is produced. In pulsating field, the rotor does not rotate due to ~~inter~~ inertia. (Motor) It works on the principle of electromagnetic induction. It is the single phase phenomenon in which electromotive force induces across the electrical conductor when it is placed in a rotating magnetic field.
- Single phase induction motors are not self starting because the produced stator flux is alternating in nature and at the starting, the two components of this flux cancel each other and hence there is no net torque. They are not self-starting without an auxiliary stator winding driven by an out of phase current of near 90°.

Aakriti Mehta
Aakriti
160122109
C2-2, IA-2

3) Principle on which DC motor works:
When kept in a magnetic field, a current carrying conductor gains torque and develops a tendency to move. When electric field and magnetic fields interact, a mechanical force arises.

DC series motor:



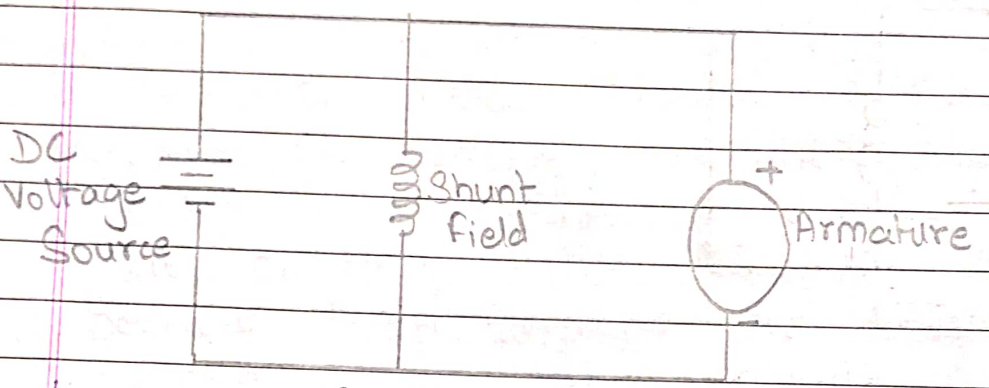
A DC series motor is a machine that is used at a place where high torque operating conditions are required. It is a machine whose winding is associated in series with the armature winding of the motor. Due to this series arrangement, the motor is able to produce more starting storque compared to other motor. A magnetic field arises in the air gap when the field coil of the DC motor is energised. The created magnetic field is in the direction of the radius of the armature. The magnetic field enters the armature from North pole side of field coil and exists the armature from the field coil's South pole side. The conductors located on the other pole are subjected to a force of the same intensity but in the opposite direction.

Aakriti Mehta
16010122109
Aakriti
C2-2, IA-2

Aakriti Mehta

These two opposing forces create a torque that causes the motor armature to rotate.

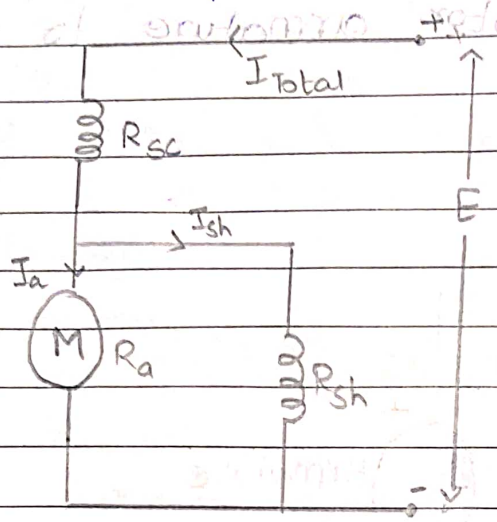
DC shunt motor



The field winding in shunt DC motors are made of many windings of thin wire, to both increase the magnetic field's strength and limit the current through the coil. By doing so, the current is reduced through the field coil and thus increases in the armature. A shunt motor is a winding field DC motor that generates magnetic field flux using electromagnets. Its field winding and armature winding are connected in parallel.

Aakriti Mehta
160101222109
Cakriti
C2-2, ~~IB~~ IA-2

DC compound motor



With a DC compound motor, the majority of the field is wound for a shunt field but with a few turns of series winding on top. The shunt is connected across the field supply and the series turns are connected in series with the armature. This provides a motor with a combination of the shunt and series characteristics. Compound motors due to their ability to perform better on heavy load changes are used in elevators. Due to their high starting torque and better speed control for pressure variations, they are used in shears and punches.