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I.D 6990

SEMESTER SIX / SUMMER

SUBJECT # POWER TRANSMISSION & DISTRIBUTION.

SUBMITTED TO # ENGR SAJID NAWAZ

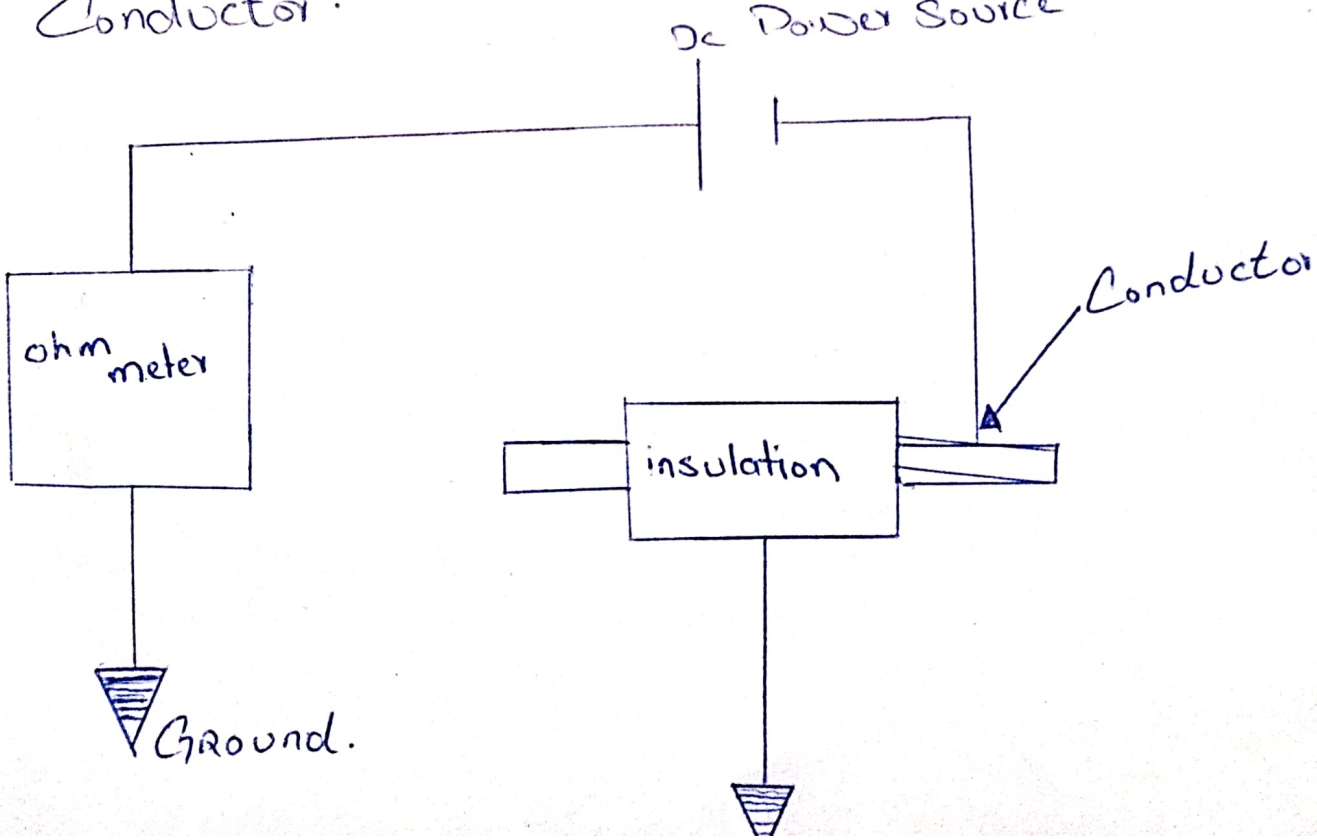
DEPARTMENT # ELECTRICAL.

 KAMRAN KHAN # ID. 6490

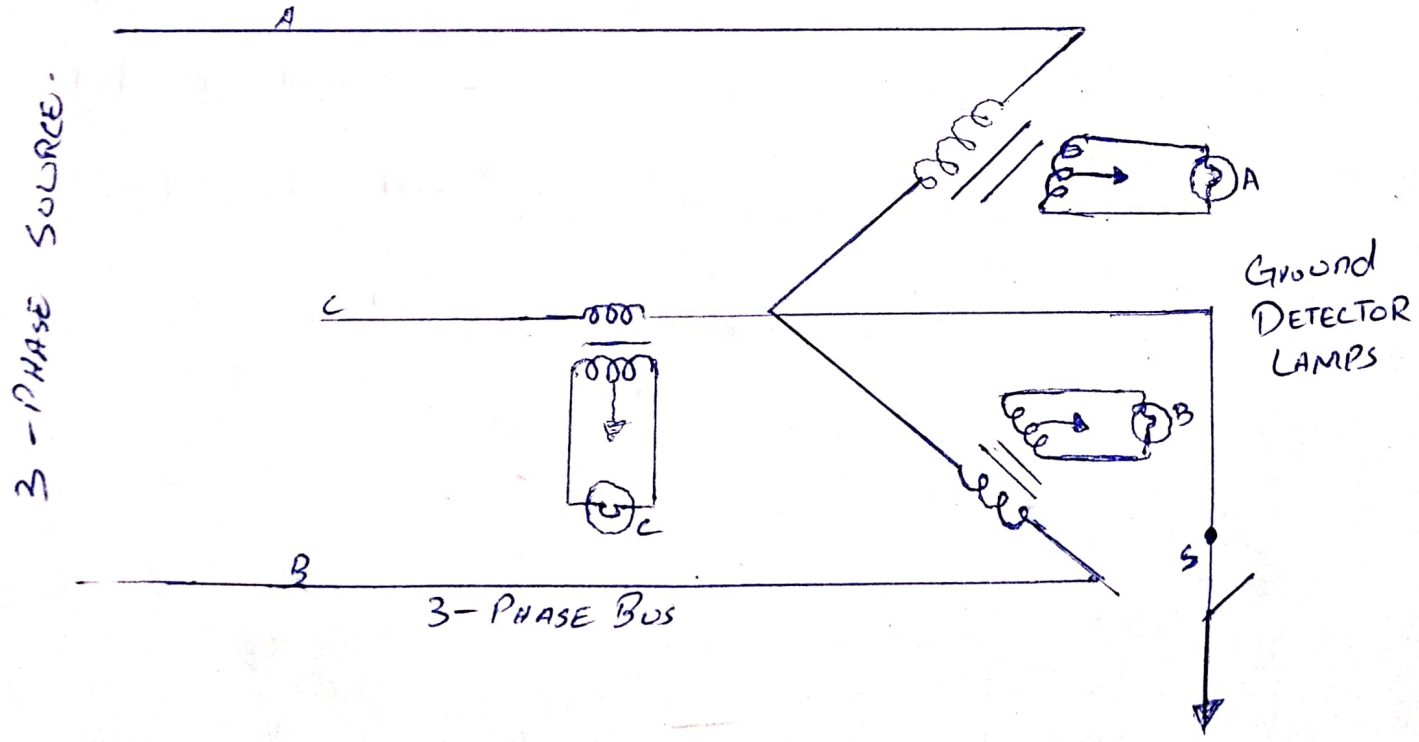
(Q No. 2)

(B) Explain ground detector?

Ans The ground detector is an instrument which is used to detect Conductor insulation resistance to ground. An ohm meter, or series of lights, can be used to detect the insulation strength of an Ungrounded distribution system. Most Power distribution System. Most Powers in use today are of grounded variety, however, some ungrounded system still exist. In the ohm meter method, a Dc voltage is applied to the Conductor. If a leakage Path exists between the Conductor insulator and ground a current will flow through the ground to the ohm meter Proportional to the insulator resistance of Conductor.



In the ground detector lamp method. A set of three lamps connected through transformers to the System is used. To check For grounds. the Switch is closed and the brillance of the lamps is observed if the lamp are equally bright, no ground exists and all the lamps receive the Same voltage. if any one lamp is dark, and dark and the other two lamp are brighter. the Phase in which the darkened lamp is in is grounded. In case, the Primary winding of the transformer is Shorted to ground and receives no voltage.



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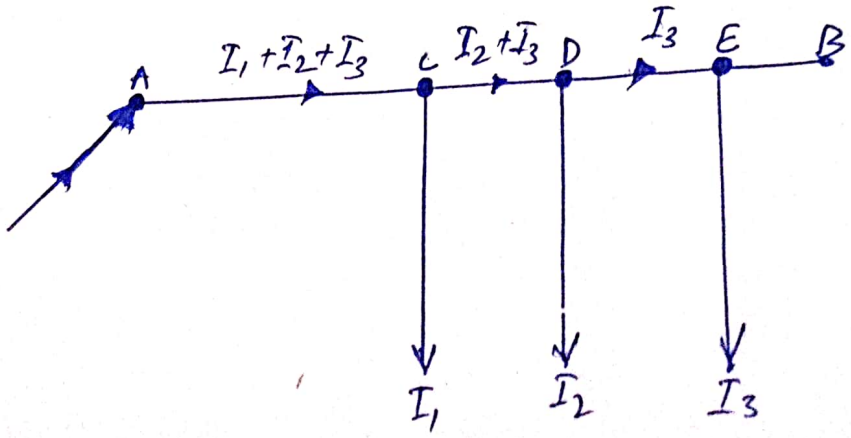
(Q NO 9) (A) Write down the types of DC distributors. Also explain any one type.

Ans: DC Distributor:

The most general method of classifying dc. distributors is the way they are fed by the feders. on the basics, d.c distributor are classified as.

- Distributor Fed at one end
- Distributor Fed at both ends
- Distributor Fed at the centre
- Ring distributor.

Distributor Fed at one end:



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* In this type of Feeding, the distributor is connected to the supply at one end and load are taken at different point along the length of the distributor.

* The current in the various sections of the distributor way From Feeding point goes on decreasing. thy current in Ac is more than the current in section cD and current in Section CD is more then the current is section DE.

* The voltage across on any the Loads away From the Feeding point goes on decreasing

* In case a fault occus in any section of the distributor. the whole distributor will have disconnected from the mains supply.

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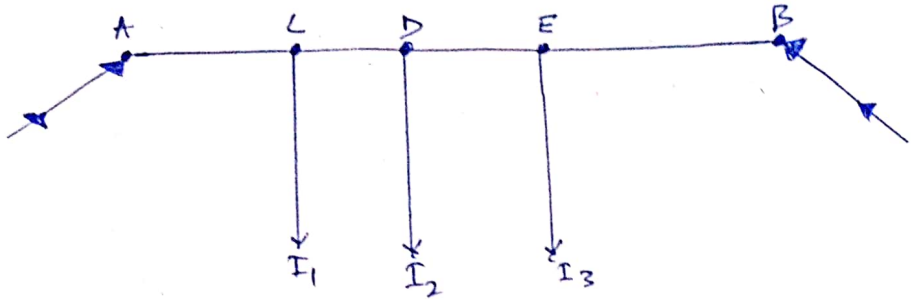
Distributor Fed at both ends



* IN this type OF Feeding, the distributor is connected to the supply mains at both end and loads are tapped OFF at different points along the length OF the distributor.

Here the load voltage goes on decreasing as we move away from the Feeding point say A, reaches minimum value and then again starts rising and reaches maximum value when we reache the other Feeding point B. The minimum voltage occurs at some load point and its never fixed. it is shifted with the variation OF Load on different section OF the distributor.

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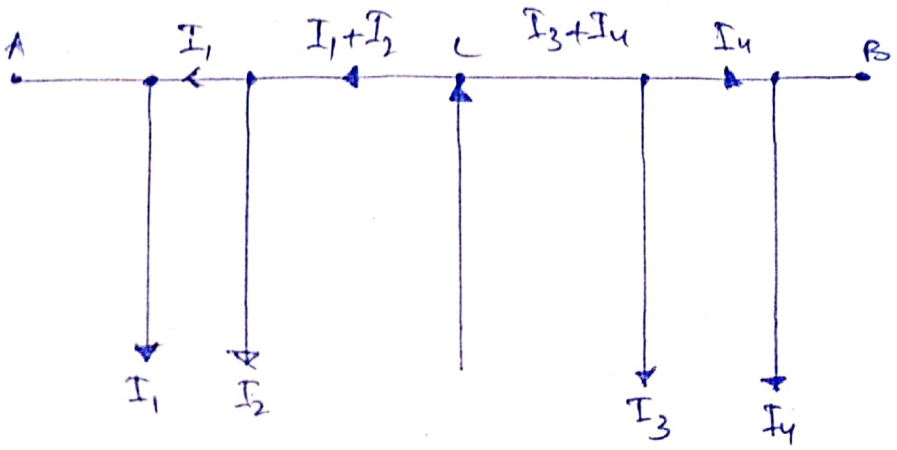
Distribution Fed at the Centre!!

Q.



In this type of feeding, the centre of the distributor is connected to the supply mains it is equivalent to two singly fed distributors, each distributor having a common feeding point and length equal to half of the total length.

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(Q NO5)

Ans: Booster

A Booster is a devile For increasing Electrical voltage or signal strength.

A booster was a motor-generator (MG) set used For voltage regulation in direct current (DC) electrical power ckt. the development of alternating current and solid state devices has rendered it obsolete. Booster are made in various configuration to suit different Application

Q-(8)

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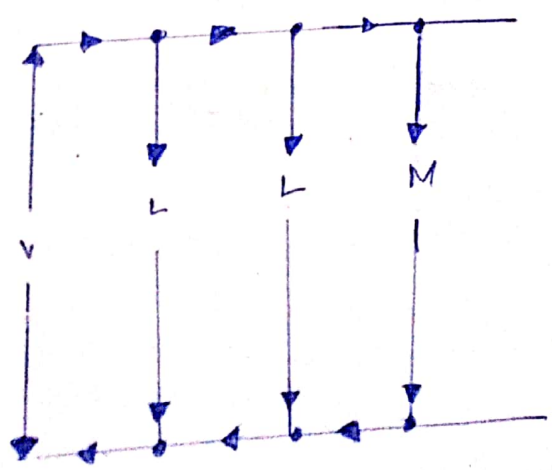
(ONOS)

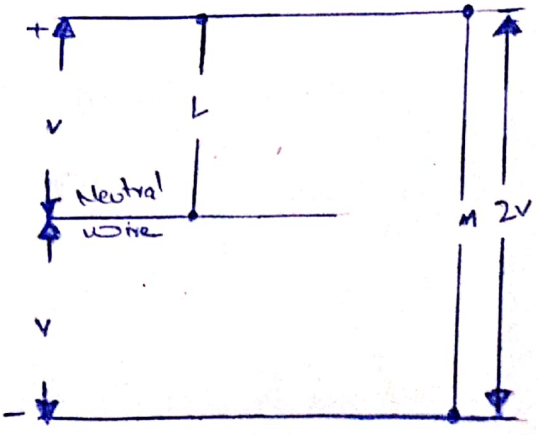
Explain two wire DC System?

ANS:

2 WIRE dc. System!!

As the name implies, this system OF distribution consists OF two wires. one is the outgoing or positive wire and the other is the return or negative wire. the loads such as Lamps motors etc. are connected in parallel between the TWO wires as.





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Q#1 ANS!

There are several method of obtaining 3 wire d.c System However the most important one Generator method.

Method of obtaining three WIRE Dc System-

Two generator method:-

In this method two Short wound dc generator G_1 and G_2 are Connected in Series and the neutral is obtained From the Common Paint between generator - Each generator Supplies load on its own side - thus generator G_1 Supplies a load Current of I_1 where as generator (G_2) Supplies load Correct of I_2 the different of load Currents of the two sides knowns as out of balance (I_1 I_2) Flows through neutral wire - This Principal of this method is that two seperate generator are required.

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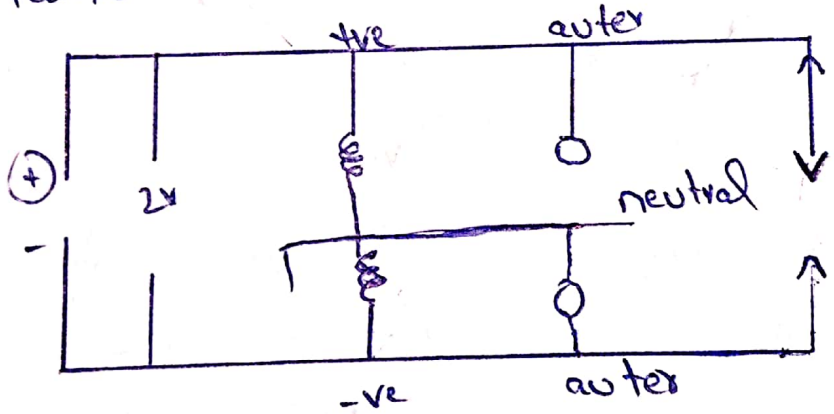
3 wire dc generator:-

The above method is costly an accoviate of the necesity of two gen for this reason 3-wire dc generator was devolaped - It consists of a standard wire machine with one or two coils of high rectance and low resistance. Conected Permently to diametrically opposite Points of armature winding The wire is obtained From the Points.



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(1) NOW!

Ans!

Solution!

Here!

$$0.1I + 0.05(I-10) + (0.01(I-30) + 0.025(I-60) + 0.075(I-70) = 92$$

$$\boxed{I = 29.04A}$$

Drop in AB = $29.04 \times 0.1 = \boxed{2.9V}$

Drop in BC = $19.04 \times 0.05 = \boxed{0.95V}$

Drop in CD = $30.96 \times 0.085 = 3.77V$

Drop in AD = $40.96 \times 0.075 = \boxed{3.07V}$

Ans:

Potential of B = 217.1V

Potential of C = 216.15V

Potential of E = 216.93V

Potential of D = 216.16V

The interconnector between Point C and

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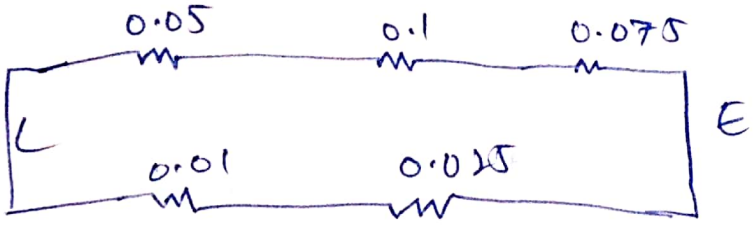

Now,

$$I = \frac{\text{P.d between Point E and C}}{\text{resistance of distribution network}}$$

P.D between Point E and C

$$= 216.93 - 216.15 = 0.76\,V$$

$$= \frac{0.225 \times 0.035}{(0.225 + 0.035)}$$

$$= 0.03\,\Omega$$

Hence!

Current Interconnector $\Rightarrow$

$$\Rightarrow \frac{0.78}{(0.03 + 0.05)}$$

$$\Rightarrow 9.75\,A \text{ From E to C}$$

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Ans.

$$-0.025I_1 - 0.01(I_1 - 30) + 0.05 \times 9.75 = 0$$

$$\therefore I_1 = 22.5A$$

Current AE $= 10 + 22.5 + 9.75 = 42V$

Current in AB $= 70 - 42.25 = 27.75A$

Drop in AB $= 27.75 \times 0.1 = 2775V$

Drop in EP $= 32.25 \times 0.025 = 0.806V$

Drop in BC $= 17.75 \times 0.05 = 0.88V$

Drop in AE $= 42.25 \times 0.075 = 3169V$

Potential of B $= 217.225V$

Potential of C $= 216.337V$

Potential of E $= 220 - 3.169 = 216.83V$

Potential of D $= 216.83 - 0.801 = 216.029V$

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(Q NO 3)

Ans!!

GIVEN DATA!

Phase 4 wire 400/230 V

Lamp OF 100 watts connected 1 Phase

neutral & Lamp OF 150 watts connected to the second phase.

Required data!

neutral wire disconnected accidently

voltage across each of them?

Solution!!

The Lamp L_1 OF 100 watts is connected between phase R and neutral whereas Lamp L_2 OF 150 watts is connected between phase y and the neutral.

Resistance OF Lamp L_1: $R_1 = \frac{(230)^2}{100} = 529\Omega$

Resistance OF Lamp L_2: $R_2 = \frac{(230)^2}{150}$

$= 352.67\Omega$

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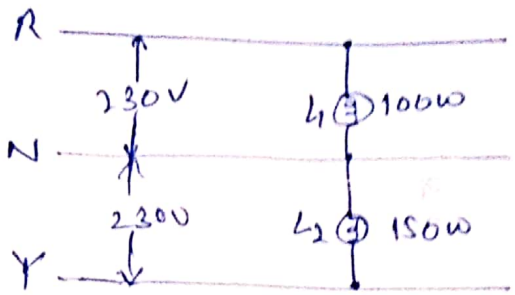

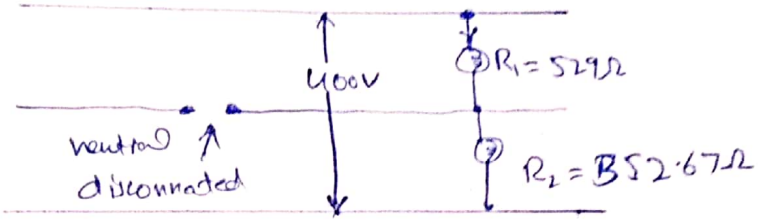

Current through lamp $I = \frac{E_L}{R_1 + R_2} = \frac{400}{529 + 352.67}$

$= 0.454A$

Voltage across Lamp $L_1 = IR_1 = 0.454 \times 529 = 240V$

Voltage across Lamp $L_2 = IR_2 = 0.454 \times 352.67$

$= 160V$