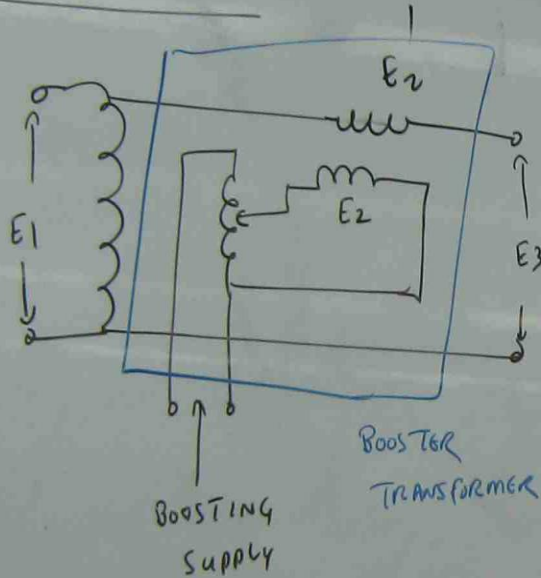


BOOSTER TRANSFORMER



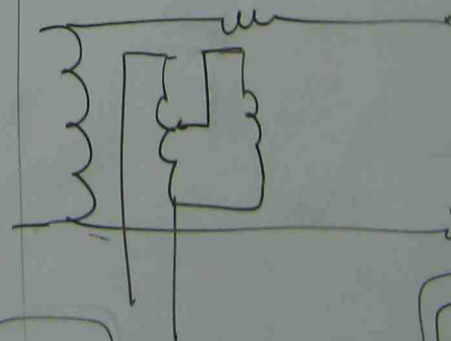
$$E_3 = E_1 + E_2$$

A SEPARATE TRANSFORMER MAY BE USED TO INJECT A VARIABLE VOLTAGE INTO A CIRCUIT FOR REGULATING PURPOSE

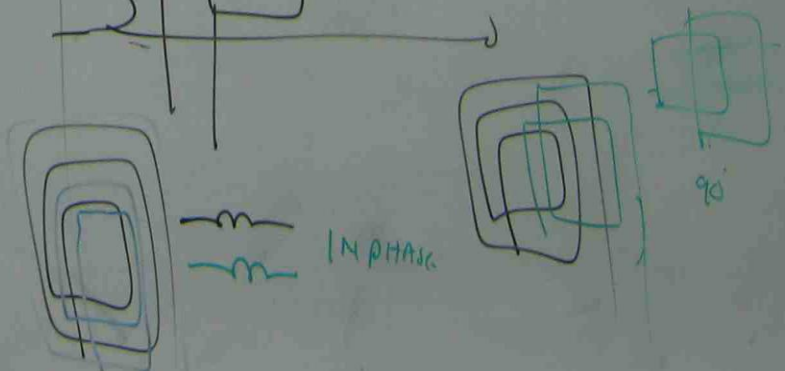
QUADRATURE BOOSTER

INJECT A VOLTAGE WITH A MAJOR COMPONENT AT 90 DEGREE TO THE EXISTING VOLTAGE

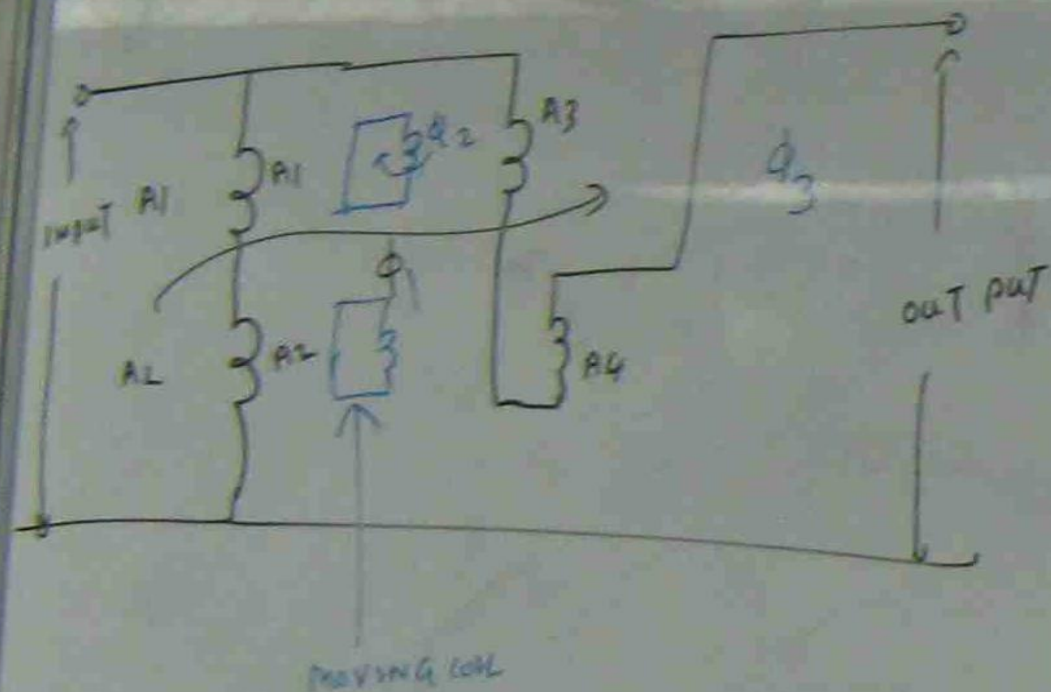
INDUCTION AND MOVING COIL REGULATORS



TO CHANGE PHASE SHIFT
90° BOOSTER IS APPLIED.



INDUCTION AND MOVING COIL REGULATOR



$$\phi_3 = \phi_1 \pm \phi_2$$

OUT PUT FLUX DEPENDS ON THE POSITION OF MOVING COIL.

VOLTAGE CONTROL

ALL MODERN TRANSMISSION SYSTEM WITH THE EXCEPTION OF THE CONSTANT CURRENT SYSTEM, OPERATE AT A CONSTANT VOLTAGE.

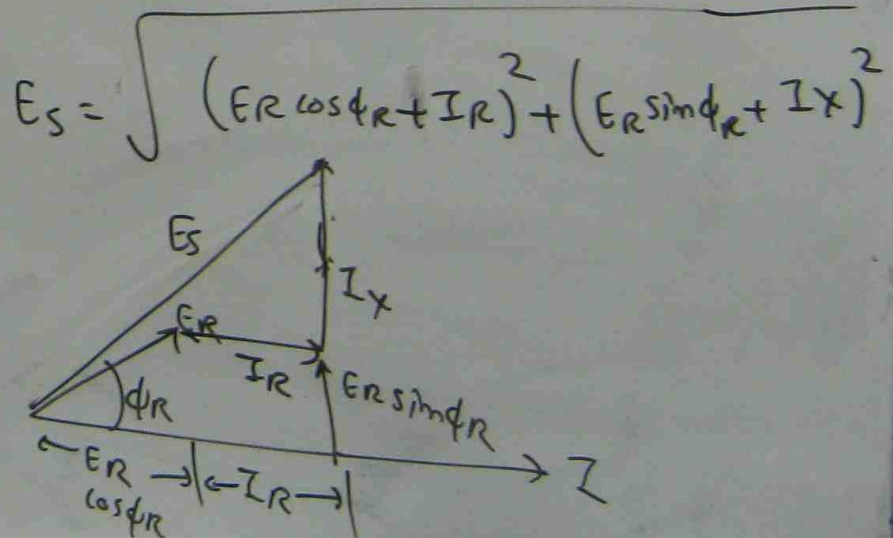
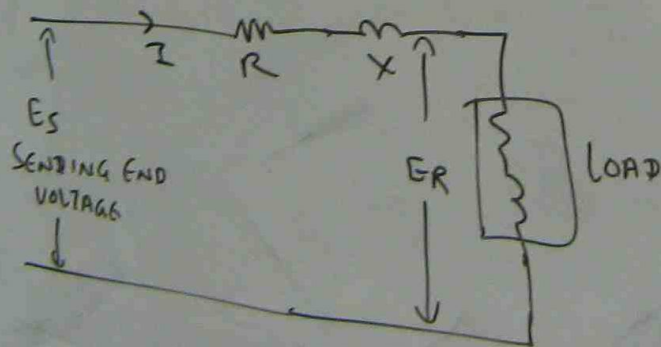
IT IS ESSENTIAL FOR THE SATISFACTORY OPERATION OF THE CONSUMERS' APPARATUS THAT THE VOLTAGE BE KEPT WITHIN NARROW LIMITS.

SAA RULE

CONSUMERS' MAIN MUST NOT EXCEED $\pm 5\%$ VOLTAGE DIFFERENCE

MEDIUM VOLTAGE = $\pm 6\%$

HIGHER VOLTAGE = $\pm 10\%$



REVIEW QUESTION (2)

Q 14 DESCRIBE BRIEFLY THE EFFECT OF VOLTAGE VARIATIONS

- VOLTAGE VARIATION REDUCES THE LIGHT OUTPUT OR SHORTEN THE LIFE OF THE LAMP.
- VOLTAGE VARIATION CAUSES OVER HEATING IN TRANSFORMER WHICH INTRODUCES THIRD HARMONICS
- SOME COMPUTERS, ELECTRONIC CONTROL EQUIPMENTS AND TELEVISION SETS ARE VERY SUSCEPTIBLE TO VOLTAGE VARIATION.

Q 15 DESCRIBE BRIEFLY THE CAUSES OF VOLTAGE VARIATIONS.

- THE SOURCE VOLTAGE MAY NOT BE CONTROLLED.
- THE VOLTAGE AT SECONDARY OF A TRANSFORMER VARIES DUE TO INTERNAL VOLTAGE DROP CAUSED BY VARIATION OF LOAD CURRENTS.
- VOLTAGE DROP ALONG TRANSMISSION AND DISTRIBUTION LINE

Q17

STATE THREE GENERAL METHODS OF VOLTAGE CONTROL.

- TRANSFORMERS
- CAPACITOR BANK
- REACTORS.

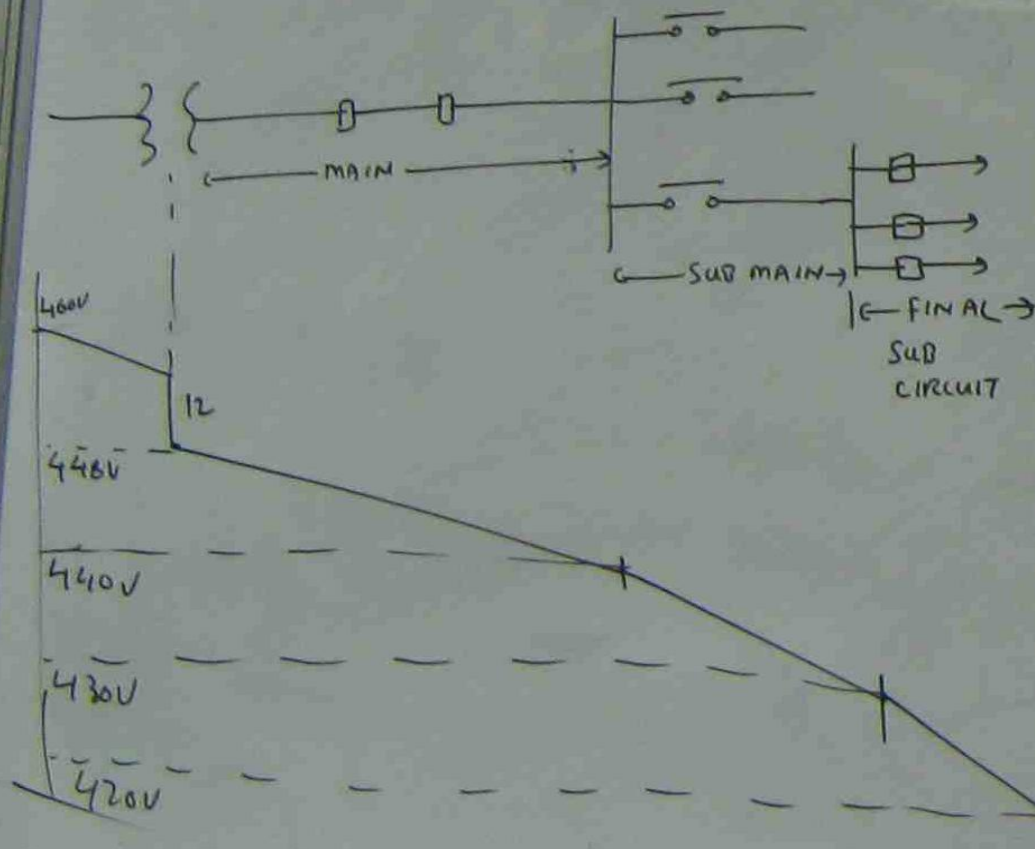
Q18

LIST 5 VOLTAGE CONTROL DEVICES IN THE DISTRIBUTION SYSTEM.

- OFF LOAD TAP CHANGER
- ON LOAD TAP CHANGER
- BOOSTER TRANSFORMER
- MOVING COIL REGULATOR
- INDUCTION REGULATOR

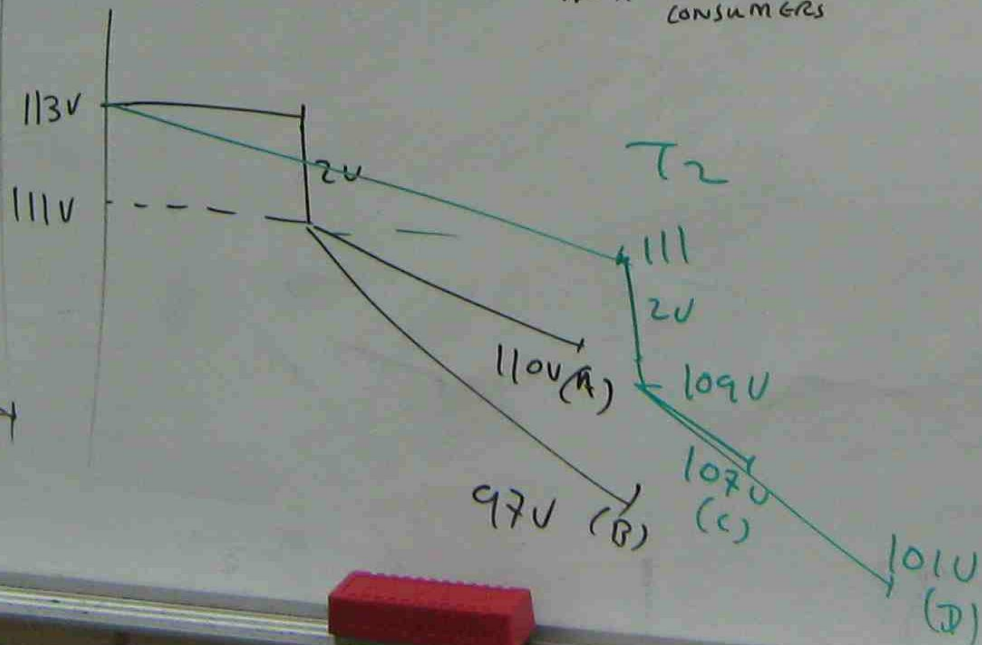
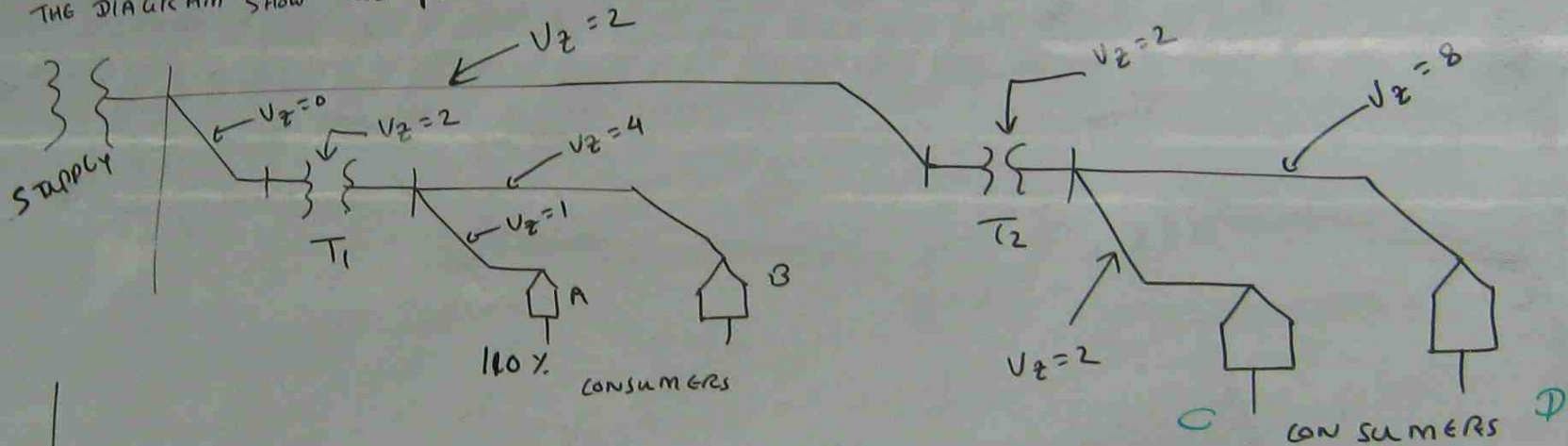
VOLTAGE PROFILE CHART

VOLTAGE PROFILE CHARTS ARE USEFUL FOR STUDYING THE PATTERN AND TO LOCATE CAUSES OR REASON FOR ABNORMAL VOLTAGE CONDITIONS.



REVIEW QUESTION (2)

Q.16 FOR THE SIMPLIFIED SINGLE LINE DIAGRAM BELOW, PLOT THE VOLTAGE PROFILE FOR HEAVY LOAD PERIOD. THE VOLTAGE AT POINT (A) IS 110% NOMINAL. THE V_2 VALUES INDICATED ON THE DIAGRAM SHOW THE PERCENT VOLTAGE DROP PER UNIT OF CONSUMER HEAVY CURRENT.



REVIEW QUESTION (2)

Q 14 DESCRIBE BRIEFLY THE EFFECT OF VOLTAGE VARIATIONS

- VOLTAGE VARIATION REDUCES THE LIGHT OUTPUT OR SHORTEN THE LIFE OF THE LAMP.
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- VOLTAGE DROP ALONG TRANSMISSION AND DISTRIBUTION LINES.

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STATE THREE GENERAL METHODS OF VOLTAGE CONTROL.

- TRANSFORMERS
- CAPACITOR BANK
- REACTORS.

Q 18

LIST 5 VOLTAGE CONTROL DEVICES IN THE DISTRIBUTION SYSTEM.

- OFF LOAD TAP CHANGER
- ON LOAD TAP CHANGER
- BOOSTER TRANSFORMER
- MOVING COIL REGULATOR
- INDUCTION REGULATOR

Q 19

DESCRIBE THE USE OF VOLTAGE PROFILE CHART

TO STUDY THE PATTERN AND TO LOCATE THE CAUSES OR REASONS FOR ABNORMAL VOLTAGE CONDITIONS.