

Scheme G
Sample Test Paper- I

Course Name : Diploma in Electrical Engineering

Course Code : EE/EP

17417

Semester : Fourth

Subject Title : Transmission & Distribution of Electrical Power.

Marks : 25

Time: 1 hour

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

Q1. Attempt any THREE

9

Marks

- a) Define Primary transmission & Secondary transmission of electrical power and also state the standard transmission voltages used in India.
- b) Compare Copper & Aluminum as a conducting material on basis of
i) Resistivity ii) Tensile Strength iii) Volume of Material for given length of line.
- c) List any three causes of insulator failure in transmission line.
- d) Identify the effect related to figure-1 and state it.

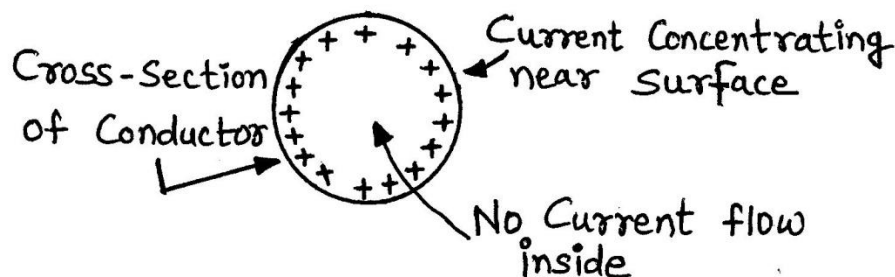


Figure 1

Q2. Attempt any TWO

08

Marks

- a) State classification of (i) Transmission line according to voltage level.
(ii) Length of transmission line.
- b) What is Ferranti Effect? Describe it with necessary phasor diagram.
- c) State with reasons any four advantages of High voltage used for transmission of Electrical Power.

Q3. Attempt any TWO

8

Marks

- a) State the desirable properties of insulating material used in cables? List any two examples of such material.
- b) List types of supporting structures used in transmission & Distribution of Electrical Power with necessary labeled diagrams. Describe them on basis of (i) Life. (ii) Maintenance.
- c) A three-phase overhead transmission line is being supported by three disc insulators. The potential across line unit is 17.5KV. Assume that shunt capacitance between each insulator & earth metal work of tower to be $1/10^{\text{th}}$ of capacitance of the insulator.
(i) Line Voltage. (ii) String Efficiency.

Scheme G
Sample Test Paper- II

Course Name : Diploma in Electrical Engineering

Course Code : EE/EP

17417

Semester : Fourth

Subject Title : Transmission & Distribution of Electrical Power.

Marks : 25

Time: 1 hour

Instructions:

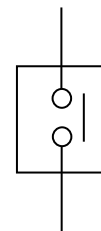
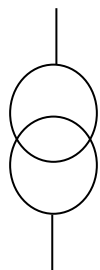
1. All questions are compulsory
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3. Figures to the right indicate full marks
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5. Preferably, write the answers in sequential order

Q.1 Attempt any THREE

9

Marks

- e) What is Corona? Also state the factors affecting corona.
- f) Draw layout of monopolar HVDC transmission line.
- g) Define :-
 - i) Efficiency & Regulations for transmission line
 - ii) Distribution Sub-station.
- h) Identify following symbols used for sub-station equipment in substation and state their functions.



(i)

(ii)

(iii)

Q.2 Attempt any TWO

08

Marks

- a) Draw nominal π network for medium transmission line & draw its phasor diagram.
- b) Compare EHVAC & HVDC transmission line on basis of Voltage Level, Regulation, Conductor size and Major Equipment required.
- c) A Single-phase overhead transmission delivers 1000 KW at 11KV at 0.8 power factor lagging. The total resistance and inductive reactance of the line are 0.25 ohm per KM & 0.28 ohm per KM. The line has length of 20KM.
Determine (i) Sending end voltage.
(ii) Transmission efficiency.

Q.3 Attempt any TWO

08

Marks

- a) State meaning of Primary & Secondary distribution system with their voltage level and number of conductors.
- b) State the factors to be consider for site selection for sub-station.
- c) Draw Single line diagram of 11KV/400V distribution substation. Write the function of (i) Distribution transformer (ii) AB switch.

Scheme G
Sample Question Paper

Course Name : Diploma in Electrical Engineering

Course Code : EE/EP

17417

Semester : Fourth

Subject Title : Transmission & Distribution of Electrical Power.

Marks : 100

Time: 3 hour

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

Q.1 Attempt any TEN

20 Marks

- a. State the standard voltages for following in India.
 - (i) Primary transmission voltage
 - (ii) Secondary transmission voltage
- b. State the necessity of Transmission of Electricity.
- c. State what type of conductor you will suggest for following voltage level.
 - (i) 33KV
 - (ii) 220KV.
- d. State the function of following layer in construction of a cable.
 - (i) metallic sheathing
 - (ii) armouring
- e. State the proximity effect in transmission line conductor?
- f. State why transposition of conductor is essential in transmission line network?
- g. List any two factors that decide efficiency and regulation of transmission line?

- h. Draw equivalent circuit diagram of medium transmission line with Nominal 'T' method.
- i. State any two routes of HVDC transmission line network in India.
- j. State why three-phase, four wire supply system is preferred for secondary distribution system?
- k. "A feeder is designed for its current carrying capacity rather voltage drop in it." Justify the statement with proper reason.
- l. State the function of following component in distribution Sub-station.
 - (i) Drop out fuse
 - (ii) Anti-climbing device.

Q.2 Attempt any FOUR

16 Marks

- a) Study the figure 1 and answer following questions:-

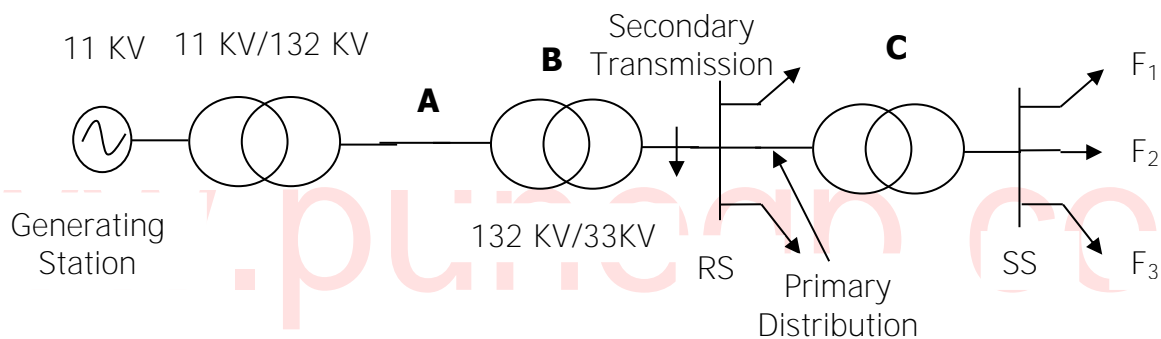


Figure 1

- (i) Which part is shown by 'A'?
 - (ii) State the meaning of symbol shown at 'B' point.
 - (iii) State the voltage rating of equipment at point 'C'.
 - (iv) What are F1, F2 & F3 shown at SS point? Which consumers are connected to them?
- b) State any four advantage of bundled conductor used in transmission line.
 - c) Compare overhead transmission line with underground cable on the basis of Public safety, Flexibility, Fault location and Current carrying capacity.
 - d) State what are single circuit and double circuit transmission line? State the types of line support used for it with its specification.
 - e) Draw a neat labeled figure for following insulator used in transmission line network: - (i) Pin type (ii) Shackle insulator.

- f) A three-phase transmission line system is suspended by a string of three discs. The lowest insulator voltage is 13KV and that across the next unit is 11KV. Find out the line voltage and string efficiency of system.

Q.3 Attempt any FOUR

16 Marks

- a) State the effect of use of high voltage in transmission of electrical power on following parameter?
1. Line current
 2. Line losses
 3. Volume of material
 4. Supporting structure weight
- b) State any four desirable properties of insulating material for transmission line insulator.
- c) Derive the mathematical expression of string efficiency of Three-phase transmission line having three disc insulators.
- d) Describe the formation of resistance and capacitance in transmission line.
- e) Describe the disruptive critical voltage and visual critical voltage in formation of corona?
- f) State the effect of lag, lead and unity power factor on efficiency and regulation of transmission line with phasor diagram. Assume that the load on line is maintained constant.

Q.4 Attempt any FOUR

16 Marks

- a) State any two advantages and two disadvantages of corona formation in transmission line.
- b) State what is generalized circuit constant of A, B, C and D in case of transmission line? Determine their values for short transmission line?
- c) A Single phase 11KV line with a length of 15KM is to transmit 500KVA load. The inductive reactance of line is 0.5 ohm per KM and resistance is 0.3 ohm per KM. Calculate the sending end voltage and efficiency of the line at 0.8 p.f. lagging.

- d) State any two advantages and two disadvantages of Extra High Voltage AC transmission line.
- e) Differentiate between EHVAC and HVDC transmission line on the basis of Voltage level, amount of power delivered, equivalent essential and economical viability.
- f) Compare between feeder and Distributor.

Q 5. Attempt any FOUR

16 Marks

- a) Identify the types of distribution system for figure 2 and state its application.

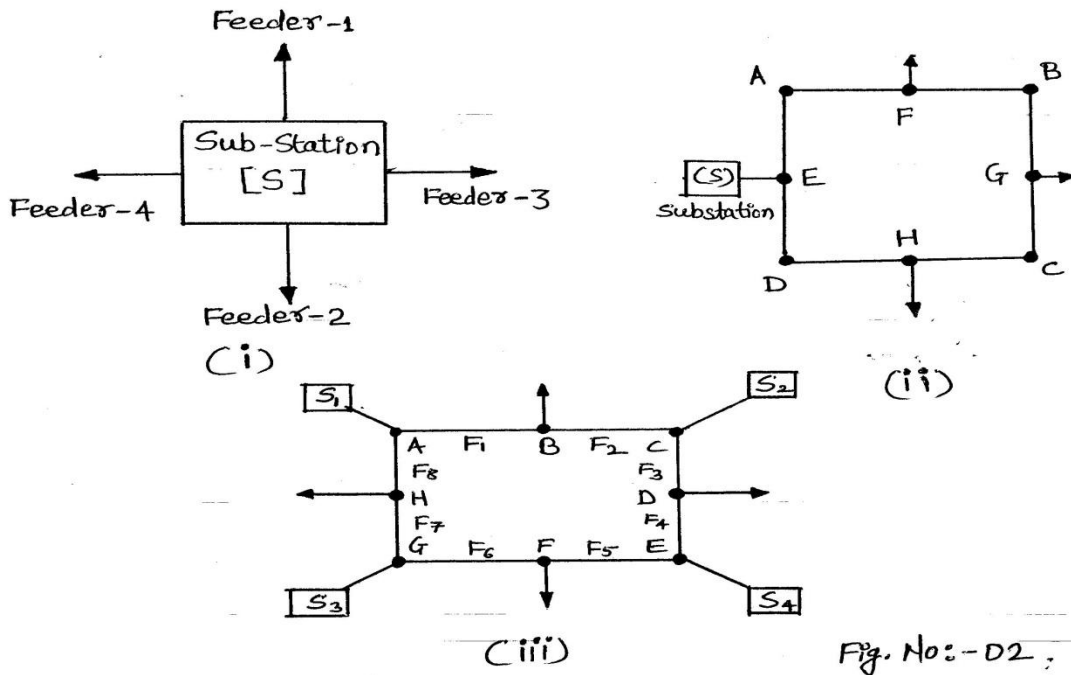


Figure 2

- b) A Single-phase AC distributor of 600m length has total impedance of $(0.02+j0.04)$ ohm and is fed from one end at 250V. If it is loaded as shown in figure no: 3. Calculate the voltage drop and voltage at far end.

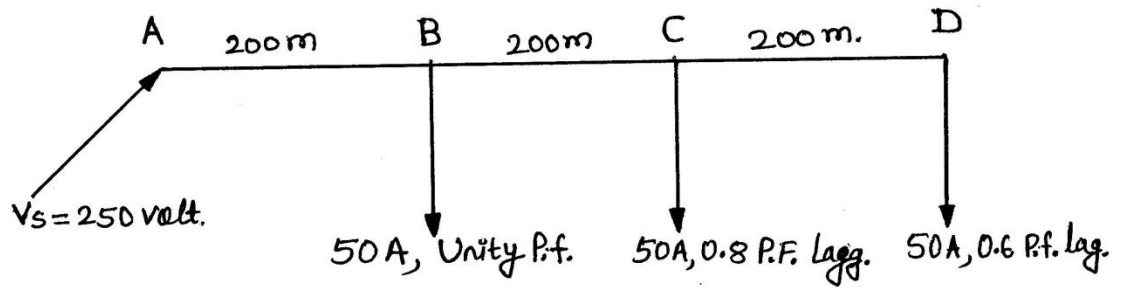


Fig. No:- 03.

- c) Compare indoor Sub-station and outdoor Sub-station on the basis of Space required, fault location, operation & maintenance and Possibility of falling of lighting stroke.
- d) What are the main components of a distribution system? State their functions.
- e) Write the functional use of following component in 11KV/433V Sub-station.
 - (i) Distribution transformer
 - (ii) Air break switch
 - (iii) Cross basing
 - (iv) Distribution box.
- f) Give classification of Sub-station on the basis of-
 - (i) Service requirement.
 - (ii) Construction

Q. 6 Attempt any FOUR

16 Marks

- a) A Three-phase line of 3KM length delivers 3000KW at power factor of 0.8 lagging to a load. The resistance and reactance per KM of each conductor are 0.4 ohm and 0.3 ohm respectively. If the voltage at the supply end is maintained at 11KV, calculate the sending end voltage and efficiency of line.
- b) State any four requirement of ideal distribution system.
- c) Suggest suitable Sub-station for following applications with suitable reasons-
 - i. Village area
 - ii. Mining area.

- d) Write equation for sending end voltage (V_s) and efficiency for medium transmission line with End condenser method with phasor diagram.
 - e) Give classification of transmission line as per its length and voltage level.
 - f) Describe the procedure of cable laying in distribution system.
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