

Department of Electrical Engineering
Assignment
Date: 24/06/2020

Course Details

Course Title: High Voltage Module: 6th
Instructor: Engt- Sajid Nawaz Total Marks: 50

Student Details

Name: Sifatullah Student ID: 14200

Q.1a) What are the difference between CTs and VTs.

Ans. The CTs (current transformer) and VTs (voltage transformer) are provided in the plants to reduce the voltage and current value of the plants to value such as to be able to detected by measurement and protection device. They also make the secondary measurement and protection circuits galvanically independent in relation to the primary power circuit at the same time guaranteeing greater safety for operators a part of the secondary winding of the instrument transformer must always be connected to ground. For correct identification and removal of the faults it is necessary for all the components to operate correctly. The transducer, CTs and represents and extremely important element in the protection chain and inadequate selection of their respective characteristics can lead to inadequate protection of the network and machines

of to unwanted trips which in many cases are even more damaging.

Q B. What are the pros and cons of AC and DC Transmission.

Ans. The most crucial difference between the AC and the DC transmission line is that the AC transmission line uses three conductors for power transmission, whereas the DC transmission line requires two conductors. The other difference between the AC and DC transmission line are explained below in the comparison chart.

1) Short Transmission Line.

The length of short transmission line is up to 80 Km.

2) Medium Transmission Line.

The length of the medium transmission line lie between 80 Km to 200 Km.

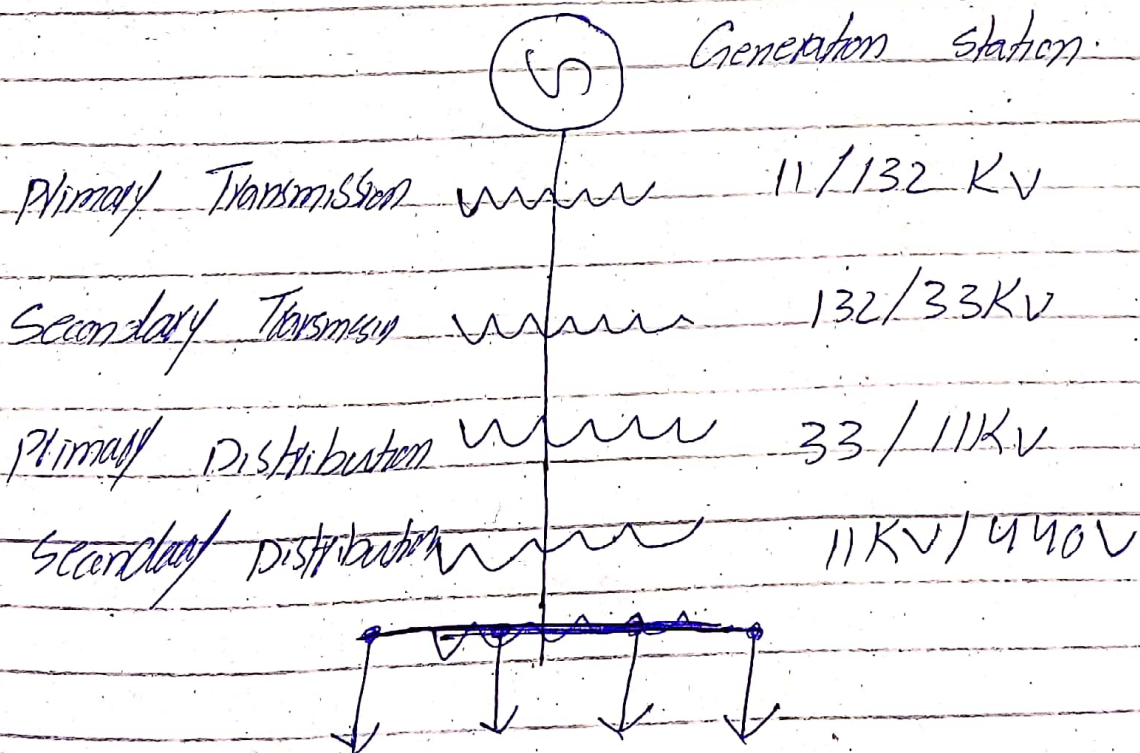
3) Long Transmission Line.

The length of the long transmission line is greater than 150 Km.

The support conductors, insulators, cross arm and clamp, fuses and isolating switches phases plates etc are the main component of the transmission lines.

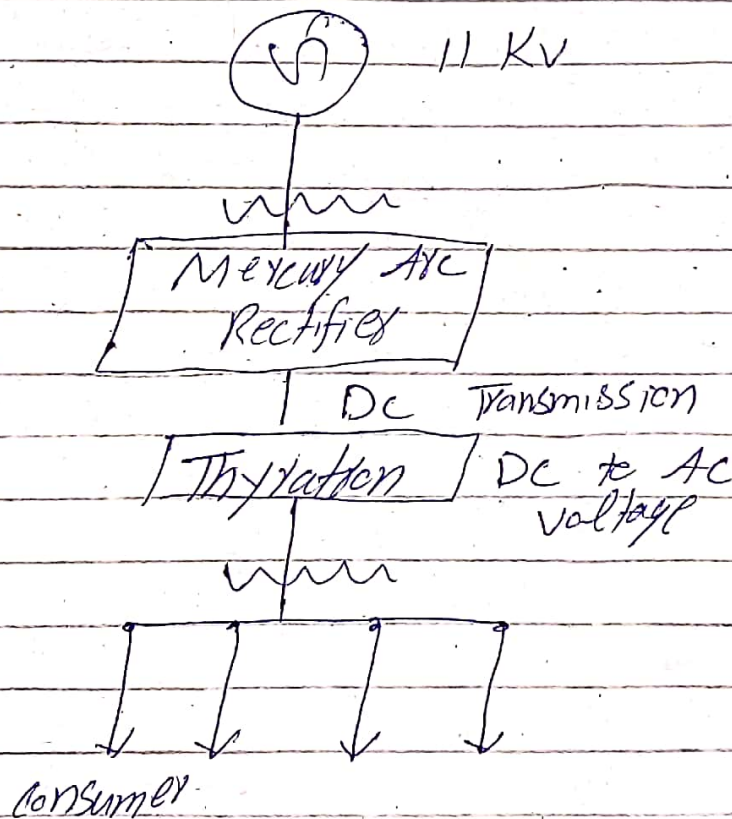
A) Ac Transmission Line

The ac Transmission line are used for transmitting the bulk of the power generation end to the consumer end. The power is generated in the generating station. The power is transmitted from one end to another with the help of step up and step down transformer.



DC Transmission Line

An DC transmission line the mercury arc rectifier converts the alternating current into the DC. The DC transmission line transmission is the bulk power over long distance. At the consumer ends the thyristor converts the DC into the AC.



Q2A What are the dangers of working on a line that runs parallel to an energized line.

Ans:

Induced voltage on parallel conductive object to an energized transmission line could reach an unsafe condition under fault and load conditions. Therefore parallel transmission line introduce the risk of induced voltage on each other conductive conductors which include the overhead earth wire (OHEW).

B) Explain the purpose of the document relating to the following

a) The electricity Act (B) OSM Act.

1) This Act maybe called Electricity Act 1910.

2) It extends the whole of Pakistan

3) It shall come into force a such as the Federal Government by notification in the Gazette direct in the behalf.

2) In this Act expression defined in the Telegraph Act 1885 have the meaning assigned to them in that Act and unless there is anything

relevant in the subject of context.

B

- a) Aerial line, mean any electric supply line which is placed above ground and in the open air.
- B) Area of supply mean the area within which also a licence is for the time being authorized by this licence to supply energy.
- c) Consumer, means any person who is supplied with energy by a licence or who is the owner or occupier of the premises which are the time being connected for the purposes of a supply of energy with the work of a licence.
- d) Daily fine, mean for each day on which an offence is continued after conviction therefore.
- e) Distribution main, means the protection of any main which a service line is or is intended to be immediately connected.
- f) electric supply line, means a wire conductor or other means used for conveying transmitting or distributing energy together with any casing coating covering pipe or insulated enclosing surrounding or supporting the same or any part thereof or any apparatus connected therewith for the purpose of so conveying transmitting or distributing such energy.

B) OSH Act

Occupational Safety and Health (OSH) also commonly referred to as health and safety. Occupational health and safety (OSH) occupational health or occupational safety is a multidisciplinary field concerned with the safety, health and welfare people of work.

Q3 Describe the arc interruption process in air blast SF₆, oil and vacuum circuit breaker.

Ans A circuit breaker in which SF₆ under pressure gas is used to extinguish the arc is called SF₆ circuit breaker. SF₆ sulfur hexafluoride gas has excellent dielectric arc quenching chemical and other physical properties which have proved its superiority over other arc quenching medium such as oil or air. The SF₆ circuit breaker is mainly divided into three types.

Non-puffer piston circuit breaker
Single-puffer piston circuit breaker
Double puffer piston circuit breaker

- Arc interruption is a process where you intercept path of arc with the purpose to extinguish it. For arc interruption we use different process like a air blast. High air pressure turbulence and arc splitting to increase the resistance of arc, so that current reduces up that much level where it is causes to flow.

- Oil circuit Breaker.

It uses oil as an interruption and insulating medium. These breakers are divided into two types based on the pressure and amount of oil used.

- Vacuum circuit Breaker.

These breakers are use vacuume as the interrupting medium due to its high elec dielectric and diffusive properties.

Q4. The transmission and distribution is divided in different categories. Distinguish between the following terms accordingly to your Home town with the help of proper diagram labeling.

Primary Transmission and secondary Transmission
Primary Distribution and secondary Distribution

Sifatullah

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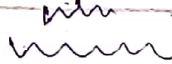
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G.S



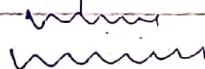
11 KV

11/33 Kv

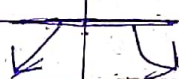


Primary Transmission

132/33 Kv



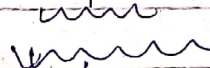
R-S



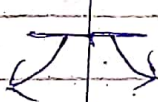
Receiving station

Secondary transmission

33/11 Kv



SS



Sub-station primary distribution

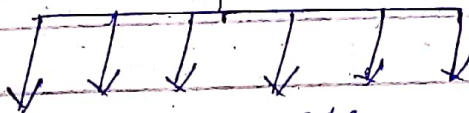
HS

11 Kv/1100V



D.S

Secondary distribution



consumers

1) Primary Transmission

The electric power at 132 kV is transmitted by 3 phase 3 wire overhead system to the out skirts of the city. This form the primary transmission.

2) Secondary Transmission

The primary transmission line terminate at the receiving station (RS) which usually line at the outskirts of the city. At the receiving station 33 kV by step down transformer forms this station electric power is transmitted at 33 kV 3-phase 3 wire overhead system to various substation (SS) located at the strategic secondary the city. This term the secondary transmission.

3) Primary Distribution

The secondary transmission line terminate at the substation where voltage is reduced from 33KV to 3 phase, 3 wire. The 11 KV run important road side of the city. The from the primary distribution. It may be noted that summers having demand more than 50 Kw are generally supplied power at 11 KV with their own sub-station.

4) Secondary distribution

The electric power from primary distribution sub-station (DS). These sub-station are located near the step down the voltage to 400V 3 phase, 4 wire for secondary distribution. Lighting load is connected between any one phase and neutral where 3 phase connected across 3 phase line directly.