

QUESTION: 1

PART: A

ANSWER:

DIFFERENCE BETWEEN CTs & VTs

CURRENT TRANSFORMERS (CTs)

VOLTAGE TRANSFORMERS (VT)

- | | |
|---|---|
| 1: The primary winding of a C.T have smaller number of turns than secondary | The primary winding of a V.T have larger number of turns than secondary. |
| 2: The secondary of a C.T can not be open circuited in any circumstance when it is under service. | The secondary of a V.T can be open circuited without any damage being caused either to the operator or the transformer. |
| 3: A CT may be considered as a | VT may be considered as a |

series transformer.

parallel transformer

4.) The primary current in a C.T is independent of the secondary circuit conditions (burden/Load).

The primary current of a V.T depends upon the secondary circuit conditions (burden/Load).

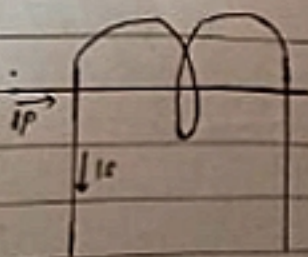
5.) The primary winding of the CT is connected in series with the line.

The primary winding of V.T is connected across the line of voltage to be measured. Hence the full line voltage is impressed across its terminal.

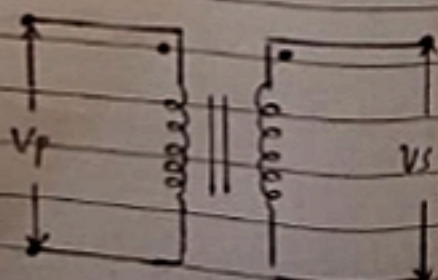
6.) With the help of C.T. a SA ammeter can be used to measure high current like 200 A.

With the help of V.T. a 120V voltmeter can be used to measure very high voltages like 11kV.

SYMBOLIC DIFFERENCE



Symbol of CT



Symbol of VT

Question = Part B

Answer: B

* Pros of AC Transmission.

- ① Power can be generated at high voltages as there is no communication problem.
- ② A.C voltage can be conveniently step up or step down.
- ③ High voltage transmission of A.C power reduces losses.

* Cons of A.C Transmission.

- ① Problems of inductance & capacitance exist in transmission line.
- ② Due to skin effect, more copper is required.
- ③ Construction of A.C. transmission line is more complicated as well as costly.

* Pros of D.c Transmission.

- ① It requires only Two Conductors.
- ② There is no problem of inductance, capacitance and phase displacement which is common in A.c Transmission.
- ③ For the same load and sending voltage drop in D.c Transmission line is less than in A.c Transmission.

* Cons of D.c Transmission.

- ① Generation of power of high D.c voltage is different due to communication problem and connect be used utilized at consumer ends.
- ② Step-up or Step-down Transformation of D.c voltages is not possible in equipment like P.F.F.

vital

6966

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Question = 02. Part (A)

Answer =

Induced Voltage on parallel
Conductive object to an
energized Transmission Lines

an unsafe condition under

Fault condition therefore

parallel -

(*) Transmission line introduced

voltage on each other

conductive conductor, which

includes the overhead

earth wires

Question = 02 Part B(A)

Answer: Electricity Act.

An electric arc is a luminous discharge of high current that is formed when strong current jumps a gap between two electrodes.

* In arc current, this is often high, of small duration and luminous, in which electrons are said to jump across a gap.

(*) Electricity arc specially designed electrodes. Can produce very high temperatures and bright light.

(*) Such purpose welding & illumination is spotlights. (e.g.) A huge electric arc between a cloud and the earth similar to sparks caused by discharge of static electricity.

Emp Example: 02

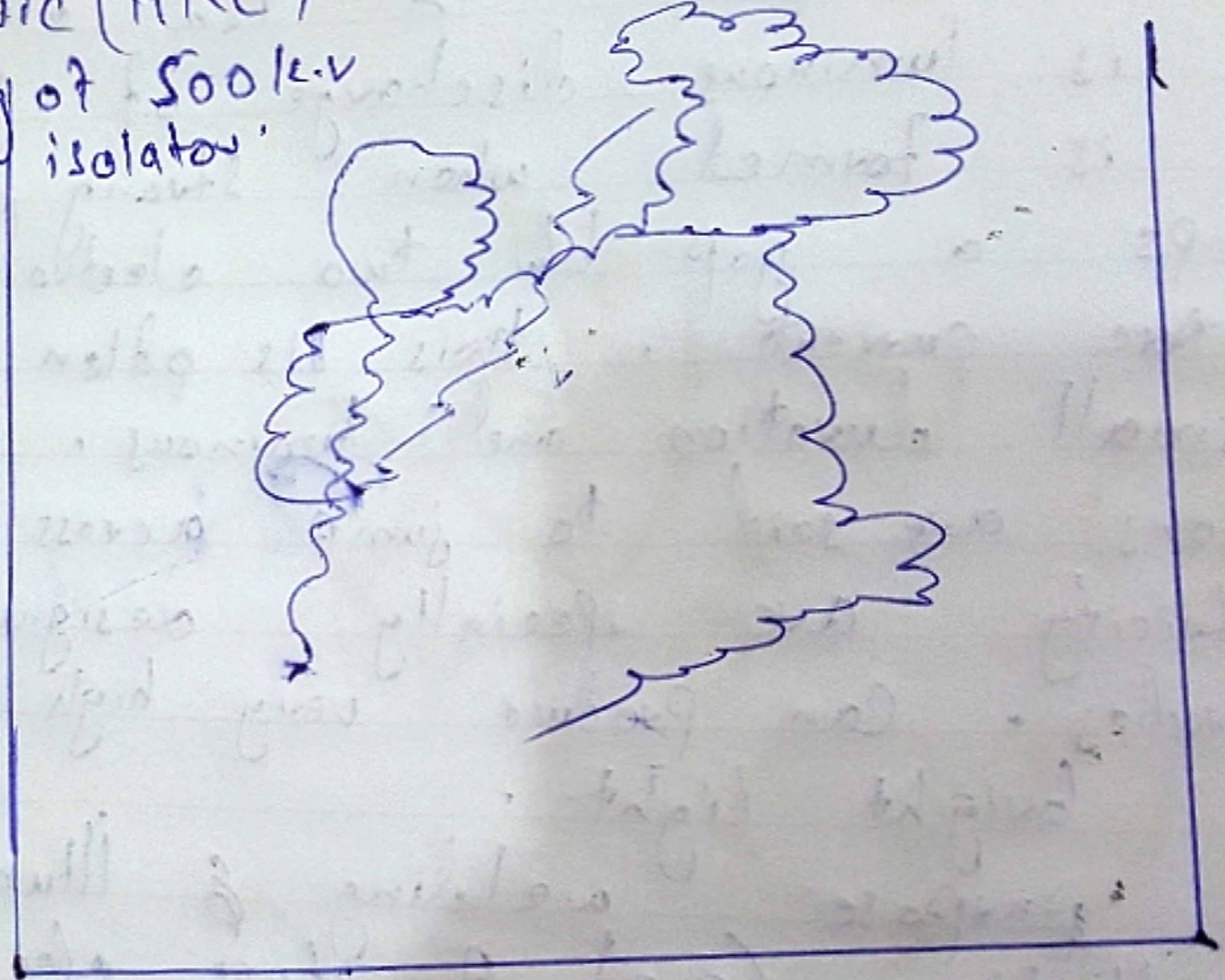
Opening of insulator an arc flash is an abrupt, intense release of electrical energy that may occur between conductors, where they both may be live and the other may be at ground.

(*) Electric arcs associated with high current quite often in kilo-amperes and temperatures of thousands degree typically $10,000^{\circ}\text{C}$.

Diagram of Electric Arc

Electric (ARC)
Opening of 500kV
isolator.

Resulting from



(B)

#(B)

OSHACT

The act created the Occupational Safety and Health Administration (OSHA) an agency of the Department of Labour. OSHA was given the authority both to set and enforce work place health and safety standards. The Act also created an independent Occupational Safety and Health Review Commission to review enforcement priorities and cases.

QUESTION: 3

ANSWER:

ARC INTERRUPTION IN AIR

BLAST CKT BREAKER:

The essential features of air blast ckt Breaker. They are fixed and moving contact in closed position by spring pressure under normal operating condition. Thus the arc is interrupted and the space b/w the contact is finished with fresh air flowing through. No ZZIP.

ARC INTERRUPTION IN SF6 CKT

BREAKER:

In the normal operating condition the contact of the breaker are closed when fault occur in the system contact are pulled apart &

the arc is structure b/w them the displacement of moving contact is synchronized with the value which enters in the arc interrupting chamber at is pressure of about 16 kg/cm^2 . These ions increase the dielectric strength of gas and hence the arc is existing.

ARC INTERRUPTING IN OIL CKT BREAKER;

Oil Ckt Breaker

which is used oil as a dielectric or insulating in oil ckt breaker. Contact of the breaker are made to separate within an insulating oil. when the fault occur in the system the contact of the ckt breaker is open under insulating oil and they are developed b/w them are evaporated in surrounding of oil.

Q:-4

TRANSMISSION SYSTEM:

- ⇒ transmission line is used for the transmission of electrical power from generating substation to the various distribution units.
- ⇒ Transmission system has primary transmission and secondary transmission.

PRIMARY TRANSMISSION

Primary transmission system connects generation station switchyard with the transmission grid station.

SECONDARY TRANSMISSION

Secondary transmission system connects a transmission grid station to a distribution grid station.

DISTRIBUTION SYSTEM:

↑

distribution system is a network of overhead transmission lines, underground cables, and transformers that carry small amounts of power to loads in medium and low voltage levels.

Distribution system has primary distribution and secondary distribution.

PRIMARY DISTRIBUTION

Primary distribution system connects a distribution grid station with the consumer transformer

SECONDARY DISTRIBUTION

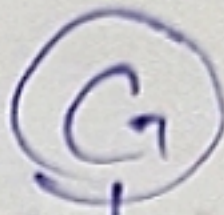
The secondary distribution system connects the consumer transformer to the supply service mains.

TABLE

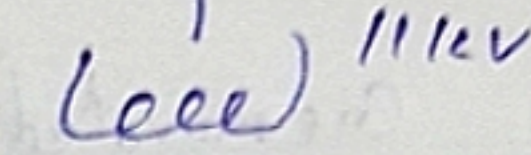
SUB SYSTEM	VOLTAGES USED
Primary Transmission	500kV and 220kV
Secondary Transmission	132kV and 66kV
Primary Distribution	11kV
Secondary Distribution	220-230V (single phase) 380-400V (three phase)

Construction

3 Phase



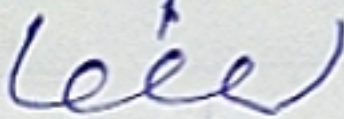
11/132 kV



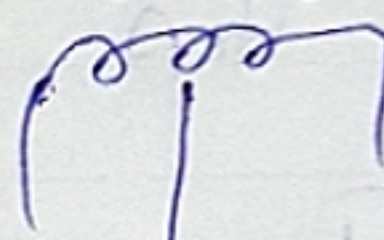
Step up T.

132 kV

Primary Transmission



Receiving Station

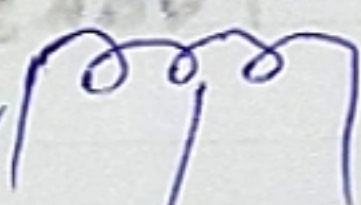


33 kV

Step down T.

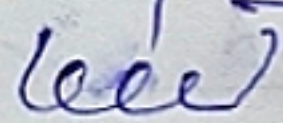
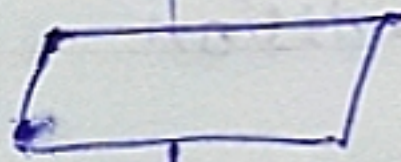
33 kV

33/3.3 kV



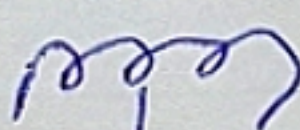
Step down Trans

Primary Distribution



3.3 kV

Distribution T.



Secondary Distribution

440/220

Distribution

