Fawad ur Rehman 13820

: High Voltage :

Q.1 : Differences between CTs & VTs.

Ans : Current Transformer (CTs):

→ They are broadly employed in order to measure high magnitude current such transformer basically step down the current which is to be measured so that it can be measured with an average range ammeter.

→ A CTs generally possesses one or few primary turns, the primary side winding could be simply a conductor positioned in an empty core whereas the secondary side possesses a large number of turns which are precisely

wound for a particular turn ratio.
Hence the CTs step up the voltage whereas stepping the current down.

⇒ Voltage Transformer:

→ Transforms high voltage into low voltage
→ connected in parallel with the circuit so full line voltage appears across the winding.
→ primary current & lies on secondary side of CT.
→ secondary side can be open circuited without any damage.
→ Using potential T/F a 120V voltmeter can be used to measure high voltages such as 11kV.

→ In PT, primary turns are more.

→ possess small number of secondary turns

(2) Pros & Cons of AC & DC Transmission;

→ Ans: Pros of AC Transmission:

→ The repairing and maintenance of AC substation is easier and cheap than DC substation.

→ The level of AC voltage may be increased or decreased by using step up & step down transformer.

⇒ Cons of AC Transmission :

→ In AC line, the size of conductor is greater than DC line.

→ more losses due to skin effect.

→ There are some additional line losses due to inductance.

→ More insulation are required in AC transmission line.

→ There are difficulties in controlling the reactive power.

⇒ Pros of DC Transmissions

→ two conductors used in DC while three conductors required in AC.

→ There is no inductance & surges.

→ In DC system, there is no interferenence with other communication lines & system.

→ In DC line, corona losses are very low as compare to AC.

→ In DC system, the speed control range is greater than AC system.

→ the price of DC cables is low due to low insulation.

Cons of DC Transmission:

→ Due to commutation problems electric power can't be produced produced at high voltage.

→ In high voltage transmission, we can't step-up the level of DC voltage.

→ There is a limitation of DC switches and CKT breaker and they are costly.

→ more complex & costly to AC transmission system.

→ Motor generator set is used to step down level of DC voltage & Efficiency.

Q2:(a) 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 condition under fault & load condition.

→ Therefore, parallel transmission line introduce risk of induced voltage on each other conductor's, which includes overhead earth wires.

(B) Explain the purpose of documents relating to;

① Electricity ACT

② Osh Act.

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Ans: (1) Electricity Act:

⇒ An act to provide for appointment and function of director general of electricity supply and of consumers comitties for electricity supply industry to make new provision with respect to supply of electricity through electric lines and generation & transmission of electricity for such supply to electricity consumer council & the consulative council eastablished under electricity ACT 1947.

(b)(2) Osh ACTs

⇒ The act created the occupational safety & health administration (OshA), an agency of department of labour, OSHA was given the authority of both to set & ensure enforce workplace health & safety standards. the act also created an independant occupational safety & health review commission to review enforcement priorities action & cases.

→ OSHA is responsible for enforcing the provision of occupational safety & health act of 1970.

Q3: Arc interruption process in air blast, SF6, oil & vaccum ckt breakers:

Ans:

⇒ In Air Blast:

⇒ 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 contact is finished with fresh air flowing through nozzle.

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⇒ In SF6 CKT Breaker:

→ In normal operating condition the contacts of the breakers are closed when fault occurs in the system the contacts are pulled apart & arc is structured b/w them the displacement of moving contact is synchronized with value which enters the high pressure SF6 gas in arc interrupting chamber at pressure of 16 kg/cm^2.

⇒ In Oil CKT Breaker:

→ uses oil as dielectric or insulating medium for arc

extention in oil ckt breaker the contact of breakers are made to separate within an insulating oil when the fault occurs in the system, the contact of ckt breaker open under insulating oil & they are developed b/w them and heat of arc is evaporated in surrondig of oil.

⇒ In Vacuum Ckt Breaker:

→ where the arc quenching takes place in vacuum medium the operation on & closing current carrying contact and interruption.

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Q4: Ans:→ i) Primary Transmission:

For transmission of electric power, the generating voltage (11 KV) is stepped up to 132KV or more depending upon length of transmission line and amount of power to be transmitted at generating station with help of 3phase transformers

→ carried out at 66 KV, 132 KV, 220 KV, 500KV or even more.

Secondary Transmission:

- primary transmission line terminates at the receiving station, which usually lies at outskirts of the city, because of the safety.

is reduced to 33KV by step down transformer.

② Primary Distribution:

- Secondary transmission line terminates at the sub-station where voltage is reduced from 33KV to 11KV.

- this 11KV runs along important road sides of the city.

Secondary Distribution:

- Electric power from primary distribution line (11KV) is delivered to distribution sub-station or pole mounted station.

- these sub-stations are located near consumers.

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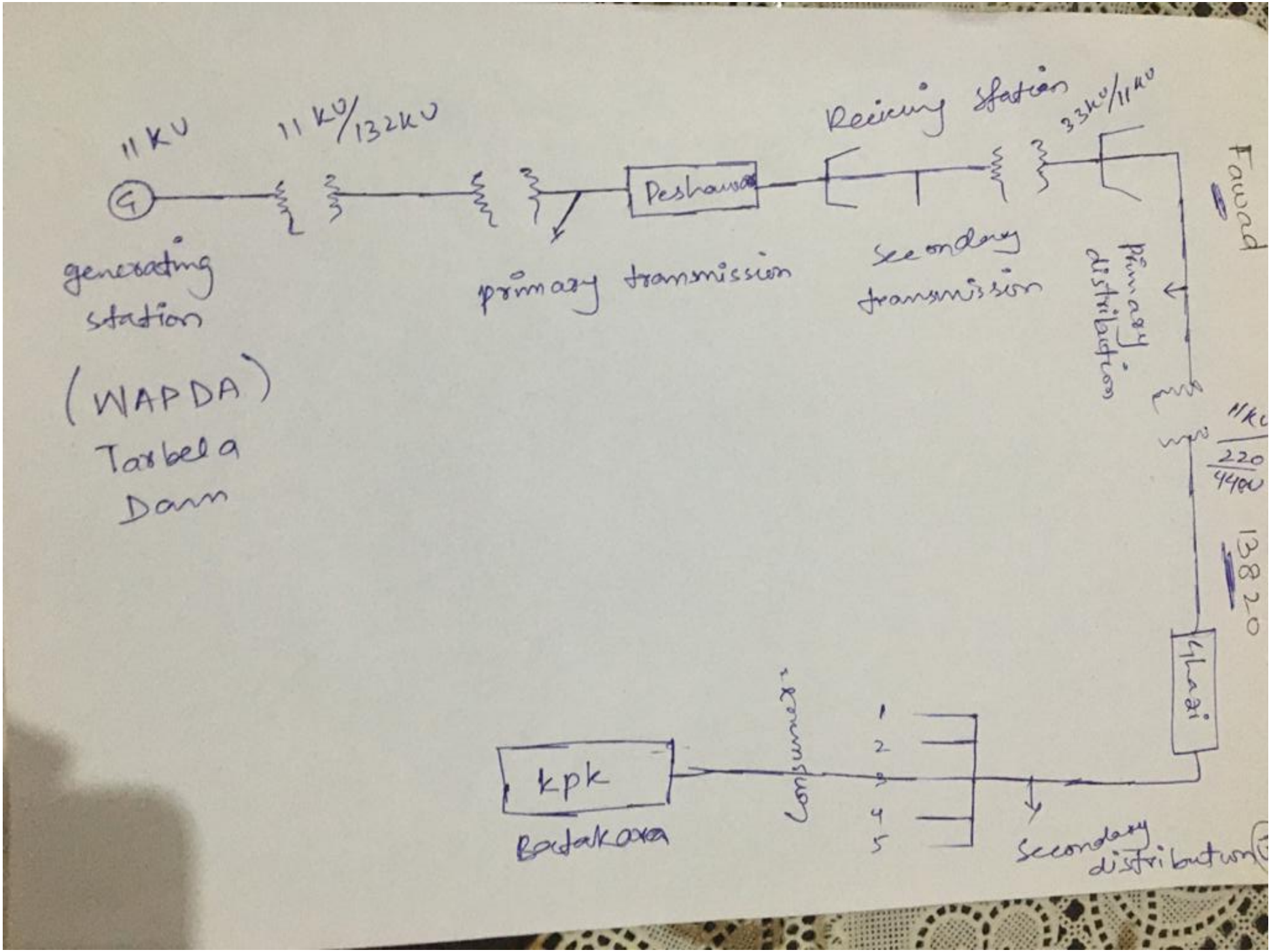
11 KV
11 KV/132KV
Peshawar
Receiving station
33KV/11KV
Fawad
generating station
(WAPDA)
Tarbela
Dam
primary transmission
secondary transmission
primary distribution
11KV/220/440V
13820
Khaki
kpk
Badaberg
Consumers
1
2
3
4
5
Secondary distribution