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Q1: High voltage system is used throughout the world briefly explain which type of high voltages used in Pakistan and also write down the categories of high voltage Transmission lines.

Ans: The highest voltage used in the world in Kazakhstan which is 1150 KV. This is ultra high voltage. But high voltage throughout the world mostly used b/w 220v and 240v. Whereas in Japan & Americas the voltage used b/w 100 & 127 volts

⇒ In Pakistan high voltage used is upto 220 KV.

⇒ The categories of high voltage Transmission Line used in Pakistan is (HV), (EHV) and (UHV).

⇒ (HV) High voltage is upto 220 KV.

⇒ (EHV) More than 220KV is Extra High Voltage.

⇒ (UHV): Ultra high voltage is 500KV which is highest Transmission Voltage used in Pakistan.

Q2: Compare the pros and cons of overhead and underground lines. Which type of line you will prefer as an electrical engineer and give proper reason?

Ans: Overhead Lines :- An overhead power lines is structure used in electric power transmission and distribution, to transmit electrical energy across large distances. It consist of one or more conductors suspended by tower and poles.

⇒ Advantages:-

\* It is less expensive.

\* Point of fault can be easily located.

\* Fault repair can be easily.

\* It can work upto 400 kv or more

\* Insulation cost is less

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⇒ Disadvantages :-

Less safe for public safety.

More chances of being subjected to lightning thunder.

More chances of supply interruption.

⇒ Under-ground Lines :-

An underground lines consist of thick conductor. This conductors or cables below the ground and transmitting electricity from one place to other.

⇒ Advantages :-

Most safe for public safety.

Very little chances of being subjected to lightning thunder.

Very little chances of supply interruption.

Very low chances of fault.

## Disadvantages:-

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More expensive.

Fault point can't easily locate.

Fault cannot easily repair.

It work only upto 66 kV.

More insulation cost.

I prefer as an electrical engineer is overhead Transmission cables.

Because an underground line is safe but not its enough. It is too much expensive than overhead line & voltage supply is minimum than overhead. If the fault occur in under (G) so cannot easily located. If the fault located than repairing time is more than overhead line. System, For me overhead line system is better because installation is easy if the fault occur than easily located and easily repair it within minimum time than underground system. Its transmit Maximum voltage than underground. and this

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Transmission and distribution system is not expensive than underground system.

Q3 The transmission and distribution section is divided in different categories. Differentiate b/w the <sup>following</sup> ~~faulting~~ terms accordingly to your hometown scenario with help of proper diagram labeling.

→ Primary Transmission & Secondary Transmission.

→ Primary Distribution & Secondary Distribution.

→ Conductor & insulator

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⇒ Primary Transmission:-  
 Transfer of large quantity of electric power from electric generating station to the substation.  
 → The voltage is stepped down at a receiving station to 33KV or 66KV.

⇒ Secondary Transmission:-  
 Secondary transmission line emerge from receiving station to connect substation located near load centers (cities etc). The voltage is stepped down again to 11KV at a substation.

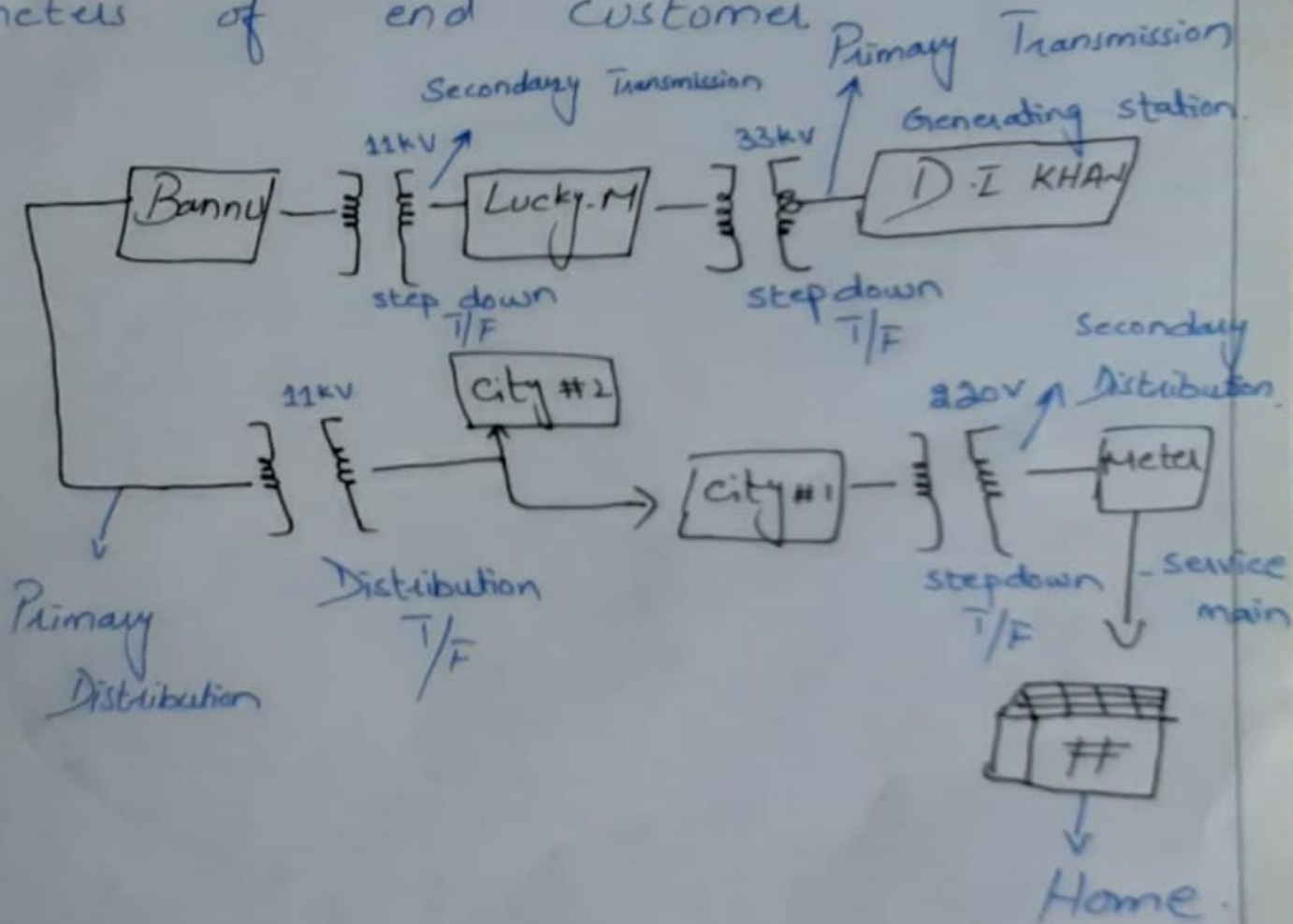
⇒ Primary Distribution:-  
 Electricity distribution is the final stage in delivery of electric power. It carry electric power from transmission to individual consumer. Primary distribution line carry the medium voltage to distribution Transformer which located near the consumer.

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Secondary Distribution

Secondary distribution

is a part of electric power distribution which carries electric energy from distribution transformer to electricity meters of end customer.



⇒ Differentiate between conductor & insulator.

⇒ Conductor :-  
Conductor is a material which allow electric current mean in the conductor electric current can flow easily.

⇒ Insulator :-  
Insulator is a material which cannot allow electric current mean in the insulator current can not flow.