

### Course Details

Course Title :- High voltage Module:- 6th

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## Q # 01

Ans :- **High voltage system is used throughout in the world**

1,200 KV is the highest voltage proposed in power transmission in kazakhstan. It was the first commercially used power line in the world

And China highest voltage used is 800 KV which is also developing a 1,100 KV system.

**Types of high voltage used in pakistan:-**

- ★ Pakistan first 765 kv high voltage transmission line are completed by the end of december in this year in Lahore ( Matiani) by working in chinese company under the auspices of the china pakistan Economic corridor(CPEC) and the last point it will be attached to the NTDC'S current 500 KV system and grid station will also established for 765 KV / 500 KV double current line
- ★ The 500 KV double current Post Qasim transmission line . which is creating and power supply cuts the to consumer's
- ★ 220 KV
- ★ 132 KV
- ★ 66 KV
- ★ 33 KV

### **The categories of high voltage transmission line**

Voltage level	Value level mark	System	Valid section
Low voltage	Below 1000 V	AC	
Medium voltage	1000 KV to 69 KV	Ac	
High voltage	Below 100 KV	Ac	Secondray transmission line
Extra high voltage	230 KV to 800 KV	Ac , DC both	Parimary transmission line
Ultra high voltage	Over 1000 KV	HVDC is preferable	

**Ans :- Comparison Between Underground & Overhead Cable**

<b>Particular</b>	<b>Over Head system</b>	<b>Underground system</b>
<b>Fault location</b>	As the overhead line is visible, it is easy to find the location of the fault.	As the underground cable is invisible, it is very difficult to find the location of the fault.
<b>Initial cost</b>	There is no requirement of digging, manholes, and trench. So, the overhead line system is cheaper than the underground system.	The initial cost of the underground transmission system is more compared to the overhead line because it needs digging, trenching, etc.
<b>Chance of fault</b>	As overhead line is exposed to the environment, the chances of faults are more.	The cables are not exposed to the environment, there is less chance of fault.
<b>Safety</b>	This system is less safe as the conductors are placed on the towers.	This system is less safe as the conductors are placed on the towers.
<b>Useful life</b>	In this system, useful life is approximately 20 to 25 years.	Useful life is approximately 40 to 50 years.
<b>Maintenance cost</b>	In this system, no need to dig at the time of maintenance. Hence, for the same number of faults, the maintenance cost is less.	In this system, to find the fault, digging is compulsory. It increases labor cost. Hence, for the same number of faults, the maintenance cost is more.
<b>Flexibility</b>	This system is more flexible. Because the expansion of the system is easily possible.	This system is not flexible. The expansion cost is nearly equal to the new erection of the system.
<b>Conductor size</b>	The conductors are placed in the atmosphere. So, the heat dissipation is better. Therefore, the size of the conductor is small compared to the underground system.	Because of the poor heat dissipation, the size of the cables is more.
<b>Application</b>	The cost of this system is low. Therefore, overhead lines are used in the long transmission system and in rural areas for the distribution system.	Because of the high cost, it is used in short distance and in populated areas. Where space is a major problem for the overhead transmission line.

## Q-No # 02

### **Is electrical Engineer a good line system :-**

Now you clear about the comparison between Overhead Lines and Underground Cables. As we have seen, both systems have their own advantages and disadvantages. According to the requirement of the system, the transmission system decided. If cost is the main consideration, the overhead line is chosen. For this system, the non-economic factors like appearance, public safety, and traffic (space) are not considered.

**The following reasons under ground system is good line system**

Underground cables used when the cost is no consideration. But in this case also, large charging current at high voltage limits the use of the underground cable for long-distance.

The good reason of underground system the birds and low plying aircraft sometimes ply into them they are no problem created in this system

**Is an electrical engineering the underground system is very good system**

## Q-No # 03

The Transmission and Distribution system are divided in different categories

- ◆ Primary distribution line
- ◆ Secondary distribution line
- ◆ Primary transmission line
- ★ Secondary transmission line

Distribution system:- starts with 11Kv and 33Kv

### ★ Primary distribution line:-

These voltage levels they are directly distributed to Industries and to heavy loads like Railways, so this voltage level distribution is called as a Primary distribution in power systems

### ◆ Secondary distribution line:-

A low-voltage network or secondary network is a part of electric power distribution which carries electric energy from distribution transformers to electricity meters of end customers.

Transmission system:- A transmission line is used for the transmission of electrical power from generating substation to the various distribution units. It transmits the wave of voltage and current from one end to another. The transmission line is made up of a conductor having a uniform cross-section along the line.

### ★ Primary Transmission line:-

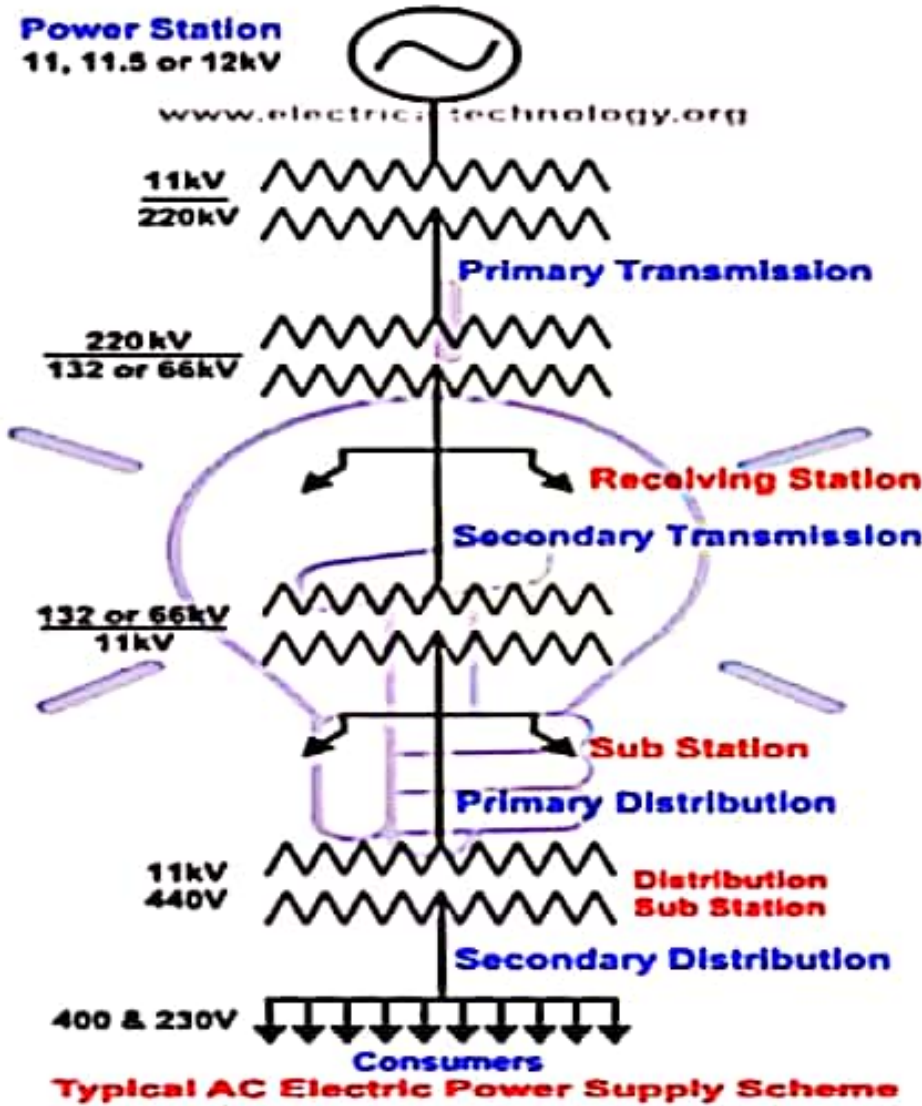
Primary Transmission is the transfer of large quantity of Electric Power from Electric Generating Station to the Sub Station with the help of Electrical lines. Usually Electrical Power generation voltage is between 11kV and 33 kV. ... Usually Electrical Power generation voltage is between 11kV and 33 kV.

### ★ Secondary transmission line:-

Secondary transmission lines emerge from this receiving station to connect substations located near load centers (cities etc.). The voltage is stepped down again to 11kV at a substation. Large Industrial consumers can be supplied at 11kV directly from these substations. Also, feeders emerge from these substations.

Q-No # 03

**My Hometown proper diagram :-**



**My Home town proper Details :-**

Power station	primary transmission line	Secondary transmission lines	Primary distribution line	Secondary distribution line
Tarbela	Grid station mardan	Par-Hotl mardan	Khuda Noor kalay mardan	Consumers
11.5 or 12 KV	220 KV	132 or 66 KV	11 KV & 440 V	400 or 230 V

**Q-No # 03**

## **Conductor & Insulator**

### **★ Conductor:-**

An electrical conductor is a substance in which electrical charge carriers, usually electrons, move easily from atom to atom with the application of voltage. Conductivity, in general, is the capacity to transmit something.

### **Conductor material :-**

Copper, steel, gold, aluminum, and brass are also good conductors.

### **★ Insulator:-**

An electrical insulator is a material whose internal electric charges do not flow freely; very little electric current will flow through it under the influence of an electric field. This

### **Examples of Insulators**

plastics, Styrofoam, paper, rubber, glass and dry air.