

Department of Electrical Engineering

Assignment

Date: 20/04/2020

Course Details

Course Title: Electric Power Distribution and Utilization

Module: 4<sup>th</sup> (B Tech)

Instructor: \_\_\_\_\_

Total Marks: 30

Student Details

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Student ID: 15276

(a)	It is often difficult to draw a line between the power transmission and power distribution systems. However, what are the different factors on the basis of which a power distribution system can be differentiated from a power transmission system? Explain briefly.	Marks 05
(b)	Underground electrical system cannot be used for very large voltages. Justify this statement.	Marks 05
(a)	Now-a-days, electrical energy is generated, transmitted and distributed in the form of alternating current. Justify this statement.	Marks 05
(b)	It is evident from comparison that both overhead and underground system has its own advantages and disadvantages. However, what are the few factors on the basis of which overhead system may be preferred over underground system?	Marks 05
(a)	Ring main scheme of connection is more reliable as compared to radial system but is less reliable as compared to interconnected system. Justify this statement.	Marks 05
(b)	Why is it important requirement of a good distribution system that voltage variations at consumer's terminals should be as low as possible?	Marks 05



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Question NO (1) (a)

Answer

Basis	Transmission Line	Distribution Line
Usage	Transmission line helps in the movement of electricity from power plant to the substations.	The distribution line carries electricity to the consumer's end.
Phase	it is carried out electricity in three phase supply system.	it requires a single phase supply system for carrying electricity.
voltage level	Carries electricity at a very high voltage about 1100 volt.	Carries electricity at very low and safe level of about 220 volts.

Current  
Conduction  
Layer

They conduct current at  
69 KV or more

The conduct less  
than 69 KV

Thickness

Transmission lines  
are thick lines.

ion line are thin  
as

Answer 1 (b)

Since the electrical field in the three core cables is tangential, the proper insulation and fibrous materials are subjected to the tangential electrical stresses this stresses weakness the fibrous material as well as the resistance and dielectric strength for the insulation along

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The tangential path it needs insulation for the cables to use under ground because it can't transfer voltage.

Answer 2 (A)

The AC is generated in power plant then power is transmitted and distributed through AC.

The current which is transmitted from power station is alternating current (AC). Alternating current is used for electric power distribution because it can

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easy be transformed to a higher or lower voltage. Electrical energy losses are dependent on current flow.

Question NO 2  
Part B

Ans

Between 1000 volts (1.1kV) and to about 33kV

High voltage subtransmission if 33-115kV and transmission if (115kV+)

used for distribution in urban and rural areas

between 33kV and about 230kV

used for connection b/w residential or small commercial ~~uses~~ customer and utility.

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Extra high  
voltage  
(Transmission)

over 230KV up  
to about 800KV

used for long  
distance, very  
High Power  
Transmission

Ultra High  
voltage

higher than 800  
KV

Answer (3)

Part A

The system is very reliable as each distribution is fed with two feeders. That means, in the event of a fault in any section of the feeders, the continuity of the supply is ensured from the alternative path.

A similar level of system reliability to that of the parallel feeders can be achieved by using ring distribution system.

Here, each distribution transformer is fed with two feeders but in different paths. Interconnected system ensures reliability in an event of transmission failure.

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also any area fed from one generating stations during peak load hours can be fed from the other generating station or substation for meeting power requirements from increased load.

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Question No B(3)  
part (B)

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Ans:;

Following are the good distribution system.

Proper voltage

(1) The lowest voltage of the consumer



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Should not be less than 216V.

- (2) The highest voltage of the consumer should not exceed 244V.
- (3) The Statutory limit of voltage variations is  $\pm 6\%$  of the rated value at the consumer's terminals.
- (4) good distribution system should ensure that the voltage variations at consumers terminals are within permissible limits.
- (5) voltage causes loss of revenue, inefficient lighting and possible burning out of motors.