



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

ELECTRICAL AND ELECTRONICS ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	TRANSMISSION AND DISTRIBUTION SYSTEMS
Course Code	:	AEE011
Program	:	B. Tech
Semester	:	V
Branch	:	Electrical and Electronics Engineering
Section	:	A & B
Academic Year	:	2019 - 2020
Course Faculty	:	Mrs. T. Saritha Kumari, Assistant Professor, EEE Mr. P Mabuhussain, Assistant Professor, EEE

COURSE OBJECTIVES:

The course should enable the students to:	
I	Determine the performance parameters of transmission lines.
II	Evaluate the voltage regulation and efficiency of short, medium and long transmissions lines.
III	Demonstrate the mechanical design of overhead line insulators and cables.
IV	Illustrate the importance of sag in the design of overhead transmission lines.
V	Discuss the operation of different distribution schemes and design of feeders.

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
UNIT-I						
1	How the electrical power can be transmitted or Distributed?	Electric power can be transmitted or distributed either by means of underground cables or by overhead lines.	Remember	CO 1	CLO 1	AEE011.01
2	What is overhead transmission line?	Transmission line is the long conductor with special design (bundled) to carry bulk amount of generated power at very high voltage from one station to another as per variation of the voltage level.	Remember	CO 1	CLO 1	AEE011.01

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
3	What are the main components of Overhead Lines?	The main components of an overhead line are: conductors, supporting towers, insulators and cross arms.	Remember	CO 1	CLO 1	AEE011.01
4	What are the commonly used conductor materials?	The most commonly used conductor materials for overhead lines are copper, aluminum, steel-cored aluminum, galvanized steel and cadmium copper.	Remember	CO 1	CLO 1	AEE011.01
5	What are the transmission line parameters?	The transmission line has parameters such as resistance, inductance, and shunt capacitance. These parameters are uniformly distributed along the line. Hence, it is also called the distributed parameter of the transmission line.	Remember	CO 1	CLO 1	AEE011.01
6	Define skin effect?	When alternating current flows through a conductor, the current density is not uniform over the entire cross section but is somewhat higher at the surface. This is called the skin effect and this makes the ac resistance little more than dc resistance.	Remember	CO 1	CLO 1	AEE011.01
7	Define series inductance of a transmission line?	The inductance of a transmission line is defined as the number of flux linkages [Wb-turns] produced per ampere of current flowing through the line: $L = \frac{\lambda}{I}$	Remember	CO 1	CLO 2	AEE011.02
8	Define GMD (Geometric Mean Distance)?	The GMD is defined by, $GMD = \sqrt[3]{D_1 D_2 D_3}$ Where D ₁ , D ₂ , and D ₃ are the distance between three conductors.	Remember	CO 1	CLO 2	AEE011.02
9	Define GMR (Geometric Mean Radius)?	The GMR is supplied by the manufacturer. For a solid conductor, GMR= 0.7788r.	Remember	CO 1	CLO 2	AEE011.02
10	What do you mean by symmetrical and asymmetrical conductor configuration in overhead lines?	Symmetrical configuration means equal spacing between any two conductors whereas asymmetrical configuration means unequal spacing between any two conductors.	Remember	CO 1	CLO 2	AEE011.02
11	What do you mean by composite conductors?	Instead of using solid round conductors, stranded conductors (or composite conductors) are used in practical transmission lines.	Remember	CO 1	CLO 2	AEE011.02
12	What is Bundled conductor?	The high voltage surface gradient is reduced considerably by having two or more conductors per phase in close proximity. This is called	Remember	CO 1	CLO 2	AEE011.02

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		conductor bundling.				
13	Define Transposition of conductors?	The transposition is a physical rotation of the conductors so that the conductor is moved to take up the next physical position in the regular sequence. The transposition of the conductor equalizes the mutual inductance and capacitance between the lines.	Remember	CO 1	CLO 2	AEE011.02
14	What is the need for transposition?	The inductance of unsymmetrical line causes voltage drops even if the voltage is in a balanced condition. Because of the inducing voltages, the magnetic field exists in the conductor which causes the interference in the line. This can be reduced by continually exchanging the position of the conductor, which can be done by transposition the conductors.	Remember	CO 1	CLO 2	AEE011.02
15	Define shunt capacitance of a transmission line?	The capacitance of a transmission line is defined as the charge accumulated on two conductors for an applied voltage between the conductors: $C = \frac{q}{V}$	Remember	CO 1	CLO 2	AEE011.02
16	Why the earth affects the calculation of capacitance of three-phase lines?	Earth affects the calculation of capacitance of three-phase lines as its presence alters the electric field lines.	Understand	CO 1	CLO 3	AEE011.03
17	Define Corona?	When the applied voltage exceeds a certain value, called critical disruptive voltage, the conductors are surrounded by a faint violet glow called corona.	Remember	CO 1	CLO 4	AEE011.04
18	What is corona effect or corona discharge?	The phenomenon of violet glow, hissing noise, production of ozone gas, and power loss and radio interference in an overhead transmission line is known as corona effect.	Remember	CO 1	CLO 4	AEE011.04
19	What are the factors the affecting corona?	The factors that affecting corona: atmosphere, conductor size, spacing between conductors and line voltage.	Remember	CO 1	CLO 4	AEE011.04
20	What are the methods for reducing corona power loss?	Methods for reducing corona power loss: increasing the conductor size, increasing the distance between conductors, using bundled conductors and using corona rings.	Remember	CO 1	CLO 4	AEE011.04
21	What is audible noise?	During corona activity, transmission lines can generate	Remember	CO 1	CLO 4	AEE011.04

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		a small amount of sound energy. This is called audible noise.				
22	What is radio interference?	The corona discharge interferes with neighboring radio and TV signals which may cause the problem. This is called radio interference.	Remember	CO 1	CLO 4	AEE011.04
UNIT-II						
1	Mention the classification of transmission lines?	Classification of transmission lines: short, medium and long transmission line.	Remember	CO 2	CLO 5	AEE011.05
2	What is short transmission line?	Transmission lines whose length less than 80kms and operating voltage less than 20kV comes under short transmission line.	Remember	CO 2	CLO 5	AEE011.05
3	What is medium transmission line?	Transmission lines having length between 80kms and 200kms and line voltages between 20kV and 100kV comes under medium transmission line.	Remember	CO 2	CLO 5	AEE011.05
4	How the medium transmission line is sub-divided?	The medium transmission line is sub-divided into Pi – model and T – model.	Remember	CO 2	CLO 5	AEE011.05
5	What is Pi model of a medium transmission line?	In nominal Pi model, it is assumed that the half of the capacitance concentrate at the each end of the line.	Remember	CO 2	CLO 6	AEE011.06
6	What is T model of a medium transmission line?	In T model, it is assumed that the capacitance is concentrated at the centre of the line.	Remember	CO 2	CLO 6	AEE011.06
7	What is long transmission line?	Transmission Lines having length above 200kms and line voltage above 100kV comes under Long Transmission Lines	Remember	CO 2	CLO 5	AEE011.05
8	Why an overhead transmission line is simplified as a two-port network?	For the sake of easier calculations, an overhead transmission line is simplified as a two-port network.	Understand	CO 2	CLO 6	AEE011.06
9	What is the use of ABCD parameters or the transmission line parameters?	ABCD parameters or the transmission line parameters provide the link between the supply and receiving end voltages and currents.	Remember	CO 2	CLO 6	AEE011.06
10	Define voltage regulation?	Voltage regulation is defined as the change in the magnitude of the voltage between the sending and receiving ends of the transmission line.	Remember	CO 2	CLO 7	AEE011.07
11	Define Efficiency?	Efficiency of transmission line is defined as the ratio of output	Remember	CO 2	CLO 7	AEE011.07

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		power to input power.				
12	What is characteristic impedance?	The characteristic impedance or surge impedance (usually written Z_0 or Z_s) of a uniform transmission line is the sqrt (L/C).	Remember	CO 2	CLO 7	AEE011.07
13	What is the value of the characteristic impedance of a lossless transmission line?	The characteristic impedance of a lossless transmission line is purely real, with no reactive component.	Remember	CO 2	CLO 7	AEE011.07
14	Define surge impedance loading?	The surge impedance loading (SIL) of a line is the power load at which the net reactive power is zero.	Remember	CO 2	CLO 7	AEE011.07
15	Define velocity of propagation?	Velocity of propagation is the speed of the transmitted signal as compared to the speed of light.	Remember	CO 2	CLO 7	AEE011.07
16	What is Ferranti effect?	In case of light loading or no load operation of transmission system, the receiving end voltage often increases beyond the sending end voltage, leading to a phenomenon known as Ferranti effect.	Remember	CO 2	CLO 8	AEE011.08
17	Explain about charging current in the transmission line?	In a transmission line, air acts as a dielectric medium between the conductors. When the voltage is applied across the sending end of the transmission line, current starts flowing between the conductors (due to imperfections of the dielectric medium). This current is called the charging current in the transmission line.	Understand	CO 2	CLO 8	AEE011.08
18	Define electrical insulating material?	The material which does not allow the electricity to pass through them is known as an electrical insulating material.	Remember	CO 2	CLO 8	AEE011.08
19	What are the properties of electrical insulating material?	High mechanical strength, high dielectric strength, non-porous and free from impurities, high resistive for preventing the flow of leakage current.	Remember	CO 2	CLO 8	AEE011.08
20	Define line supports.	The different types of structure (poles or towers) used for supporting the overhead lines or wires, such types of structures are called line supports.	Remember	CO 2	CLO 8	AEE011.08
UNIT-III						
1	What is the main use of insulator in overhead transmission	Insulator is used in the overhead transmission line between the tower and conductor for preventing the flow of electric	Remember	CO 3	CLO 9	AEE011.09

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	line?	current from the conductor to earth.				
2	What are mainly used types of insulators in overhead lines?	There are mainly three types of insulator used as overhead lines likewise: pin insulators, suspension insulators and strain or tension insulators.	Remember	CO 3	CLO 9	AEE011.09
3	What is pin insulator?	The pin insulator is supported on a bolt which is secured to the cross arm of the supporting structures. The conductor is tied to the insulator on the top groove.	Remember	CO 3	CLO 9	AEE011.09
4	What is suspension insulator?	A suspension type insulator consists of some separate insulator units connected to each other by metal links to form a flexible chain or a string.	Remember	CO 3	CLO 9	AEE011.09
5	What is strain or tension insulator?	Strain or tension is designed for handling mechanical stress at angle positions where there is a change in the direction of the line or at the terminations of the lines.	Remember	CO 3	CLO 9	AEE011.09
6	How the voltage is distributed in insulator string?	When the voltage is applied across the suspension insulator string, it is unequally distributed across the individual unit.	Remember	CO 3	CLO 9	AEE011.09
7	Define self-capacitance?	The insulator material between two metallic pins forms a capacitor of capacitance 'C' called self-capacitance	Remember	CO 3	CLO 9	AEE011.09
8	Define capacitance to earth' capacitance?	The air between the each pin and the tower form the other set of capacitors. These capacitances are called capacitances to earth.	Remember	CO 3	CLO 9	AEE011.09
9	Define string efficiency.	The string efficiency is defined as the ratio of voltage across the whole string to the product of the number of strings and the voltage across the unit adjacent to the conductor.	Remember	CO 3	CLO 10	AEE011.10
10	What are the methods of improving the string efficiency?	Use of long cross arm, use of capacitance grading and use of static shielding.	Remember	CO 3	CLO 10	AEE011.10
11	Define a cable.	A cable is nothing more than a medium to transfer electrical energy from one place to another place or we can say that a cable is just an insulated conductor which connects supply point and load point for operation of electric equipment.	Remember	CO 3	CLO 11	AEE011.11

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12	Define an underground cable.	A cable so prepared that it can withstand pressure and can be installed below the ground level and normally two or more conductors are placed in an underground cable with separate insulation on each conductor.	Remember	CO 3	CLO 11	AEE011.11
13	Define a conductor or core of an underground cable.	Conductor or Core is the main part of the underground cable. It is a conducting material generally made up of Copper, Aluminium or ACSR depending on many factors like Voltage rating, power to be handled, distance between service and load point.	Remember	CO 3	CLO 11	AEE011.11
14	Explain the function of shield for underground cable.	Shield or conductor shield is also a conducting material and its purpose is to protect the conductor against crack or discontinuity.	Remember	CO 3	CLO 11	AEE011.11
15	Describe the use of bedding in underground cables.	Bedding is the insulating layer that binds the filler material and it holds all cores of the cable.	Remember	CO 3	CLO 11	AEE011.11
16	Describe the function of armour in underground cables.	Armour is a galvanized steel layer for providing mechanical strength to the cable.	Remember	CO 3	CLO 11	AEE011.11
17	Describe the use of Serving in underground cables.	Serving is an insulating layer that protects the cable from corrosion and other chemical reactions with soil. It prevents moisture being entered in the cable.	Remember	CO 3	CLO 11	AEE011.11
18	Describe the use of insulation in underground cables.	Each core is provided with individual insulation and the purpose of this insulation is to separate the conductor from the other part or other conductors.	Remember	CO 3	CLO 11	AEE011.11
19	Describe the use of filler material in underground cable.	Filler materials are used where two or more conductors are there in the cable. The space between various sheaths is covered or filled with the insulating material and thus the name filler comes.	Remember	CO 3	CLO 11	AEE011.11
20	Classify the cables based on the number of conductors or cores.	On the basis of number of conductors in the cable, cables are of two types. 1. Single core cables 2. 3 core cables. Single core cables have only one conductor while three core cable has three conductors and they have bedding and filler too.	Remember	CO 3	CLO 11	AEE011.11
21	Classify the cables based on	Cables may be classified on the basis of voltage rating also :	Remember	CO 3	CLO 11	AEE011.11

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	voltage ratings.	<ol style="list-style-type: none"> 1. LT Cables 2. HT Cables 3. ST Cables 4. EHV Cables 5. Oil & Gas Filled Cables 6. EST Cables 				
22	Classify the cables based on insulation used in cable.	<p>Following are the type of cables on the basis of insulation used in the cable :</p> <ol style="list-style-type: none"> 1. PIC or PILC: Paper Insulated Cable 2. PVC: Poly Vinyl Chloride Cable 3. PE: Poly Ethylene 4. PTFE: Poly Tetra Fluoro 5. XLPE: Cross Linked Poly Ethylene 	Remember	CO 3	CLO 11	AEE011.11
23	Define power cables.	If large amount of power is to be transferred then these are called power cables.	Remember	CO 3	CLO 11	AEE011.11
24	Define dielectric strength of cable.	The maximum voltage that can be applied to a cable without causing it to break down, usually expressed in volts or kilovolts per unit of thickness.	Remember	CO 3	CLO 11	AEE011.11
25	Describe the grading of cables.	The process of achieving uniform electrostatic stress in the dielectric of cables is known as grading of cables	Remember	CO 3	CLO 11	AEE011.11

UNIT-IV

1	Define sag in Overhead lines.	The difference in level between points of supports and the lowest point on the conductor is called sag.	Remember	CO 4	CLO 12	AEE011.12
2	Define conductor tension.	The tension of a wire or rope is the degree to which it is stretched.	Remember	CO 4	CLO 12	AEE011.12
3	Define clearance for over head lines	Clearance is the distance between the base ground and the lowest point of the conductor. A minimum overhead clearance must be maintained for safety.	Remember	CO 4	CLO 12	AEE011.12
4	Define safety factor	The ratio of ultimate strength to the actual strength is called the safety factor.	Remember	CO 4	CLO 12	AEE011.12
5	Define ultimate strength.	It is the maximum tension on the overhead lines beyond which the conductors may broke down.	Remember	CO 4	CLO 12	AEE011.12
6	Describe the use of stringing chart.	For use in the field work of stringing the conductors, temperature-sag and temperature tension charts are plotted for the given conductor and loading conditions. Such curves are called stringing charts. These charts are very	Understand	CO 4	CLO 12	AEE011.12

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		helpful while stringing overhead lines.				
7	Describe the effect of wind and ice loading in overhead line.	In actual practice, a conductor may have ice coating and simultaneously subjected to wind pressure. The weight of ice acts vertically downwards i.e., in the same direction as the weight of conductor. The force due to the wind is assumed to act horizontally i.e., at right angle to the projected surface of the conductor. So the total weight of the conductor per length will increase with the effect of ice and wind.	Understand	CO 4	CLO 13	AEE011.13
8	Define length of span in overhead lines.	The distance between the two poles of overhead lines is called the span length. It is measured in meters.	Remember	CO 4	CLO 12	AEE011.12
9	Define slant sag.	When the conductor has the effect of wind and ice, then the conductor itself sets some angle (θ) to the vertical. In such a case the sag calculated is called the slant sag (S).	Remember	CO 4	CLO 12	AEE011.12
10	Define vertical sag,	It is the product of slant sag and cosine of the angle between vertical and actual conductor. Vertical Sag = $S \cdot \cos \theta$	Remember	CO 4	CLO 12	AEE011.12
11	Describe about conductor spacing.	Spacing of conductors should be such so as to provide safety against flash-over when the wires are swinging in the wind. The proper spacing is a function of span length, voltage and weather conditions.	Understand	CO 4	CLO 12	AEE011.12
12	Describe about conductor vibration.	If the wind velocity is small, the swinging of conductors is harmless provided the clearance is sufficiently large so that conductors do not approach within the sparking distance of each other. A completely different type of vibration, called dancing, is caused by the action of fairly strong wind on a wire covered with ice, when the ice coating happens to take a form which makes a good air-foil section.	Understand	CO 4	CLO 13	AEE011.13
13	Describe about Tower height.	Tower height depends upon the length of span. With long spans, relatively few towers are required but they must be tall and correspondingly costly. It is not usually possible to determine the tower height and span length on the basis of direct construction costs	Remember	CO 4	CLO 12	AEE011.12

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		because the lightning hazards increase greatly as the height of the conductors above ground is increased. .				
14	State the shape of sag for river crossing over head lines.	Te shape of the sag for river crossings is “catenary”.	Remember	CO 4	CLO 12	AEE011.12
15	Compare sag and span length.	Sag is directly proportional to the square of the span length. Longer span gives more sag.	Remember	CO 4	CLO 12	AEE011.12
UNIT-V						
1	Classify the electric supply systems.	The electric supply system can be broadly classified into (i) D.C. or A.C. system (ii) overhead or underground system. Now a day, 3-phase, 3-wire A.C. system is universally adopted for generation and transmission of electric power as an economical proposition.	Remember	CO 5	CLO 14	AEE011.14
2	Classify the electric distribution systems	An electric power distribution system can be classified according to its feeder connection schemes or topologies as follows - 1.Radial distribution system 2.Parallel feeders distribution 3.Ring main distribution system 4.Interconnected distribution	Remember	CO 5	CLO 14	AEE011.14
3	Describe Radial distribution systems.	This system is used only when substation or generating station is located at the center of the consumers. In this system, different feeders radiate from a substation or a generating station and feed the distributors at one end. Thus, the main characteristic of a radial distribution system is that the power flow is in only one direction.	Understand	CO 5	CLO 14	AEE011.14
4	Describe parallel distribution systems.	The disadvantage of a radial system can be minimized by introducing parallel feeders. The initial cost of this system is much more as the number of feeders is doubled. Such system may be used where reliability of the supply is important or for load sharing where the load is higher.	Understand	CO 5	CLO 14	AEE011.14
5	Describe ring main distribution systems.	In ring main distribution system, distribution transformer is fed with two feeders but in different paths. The feeders in this system form a loop which starts from the substation bus	Understand	CO 5	CLO 14	AEE011.14

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		bars, runs through the load area feeding distribution transformers and returns to the substation bus-bars.				
6	Describe interconnected distribution systems.	When a ring main feeder is energized by two or more substations or generating stations, it is called as an interconnected distribution system. This system ensures reliability in an event of transmission failure.	Understand	CO 5	CLO 14	AEE011.14
7	What are the different types of substations?	Substations may be described by their voltage class, their applications within the power system such as: Transmission substation, Distribution substation, Converter substations, Switching station, Mobile substation	Remember	CO 5	CLO 14	AEE011.14
8	What are the elements of substations?	The main elements of the substation are 1. Primary power lines 2. Ground wire 3. Overhead lines 4. Potential Transformer 5. Disconnect switch 6. Circuit breaker 7. Current transformer 8. Lightning arrester 9. Main transformer 10. Control building 11. Security fence 12. Secondary power lines	Remember	CO 5	CLO 14	AEE011.14
9	Define bus bar.	An electrical bus bar is defined as a conductor or a group of conductor used for collecting electric power from the incoming feeders and distributes them to the outgoing feeders.	Remember	CO 5	CLO 14	AEE011.14
10	Define Kelvin's law.	The cost of conductor material is generally a very considerable part of the total cost of a transmission line. Therefore, the determination of proper size of conductor for the line is of vital importance. The most economical area of conductor is that for which the total annual cost of transmission line is minimum. This is known as Kelvin's Law after Lord Kelvin who first stated it in 1881.	Understand	CO 5	CLO 14	AEE011.14
11	What are the applications of Kelvin's law?	Kelvin's law should not be applied to underground cables and high voltage overhead lines. Kelvin's law may be successfully used for overhead lines of voltage below 30KV.	Remember	CO 5	CLO 14	AEE011.14

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12	What are the limitations of high transmission voltage?	It is advisable to use the highest possible voltage for transmission of power in a bid to save conductor material. However, it must be realised that high transmission voltage results in (i) The increased cost of insulating the conductors (ii) The increased cost of transformers, switchgear and other terminal apparatus.	Remember	CO 5	CLO 15	AEE011.15
13	What are the elements of transmission line?	The elements of the transmission line are Conductors, Step-up and step-down transformers, Line insulators, Support, Protective devices, Voltage regulating devices.	Remember	CO 5	CLO 14	AEE011.14
14	What are the fundamental economic principles that influence the electrical design of a transmission line?	The fundamental economic principles that influence the electrical design of a transmission line are (i) Economic choice of conductor size (ii) Economic choice of transmission voltage	Understand	CO 5	CLO 14	AEE011.14
15	What is the empirical formula for determining the economic transmission voltage?	According to American practice, the economic transmission voltage between lines in a 3-phase a.c. system is $V = 5.5 \sqrt{0.62l + \frac{3P}{150}}$ where V = line voltage in kV P = maximum kW per phase to be delivered to single circuit l = distance of transmission line in km	Remember	CO 5	CLO 15	AEE011.15
16	Define power factor.	The ratio of the actual electrical power dissipated by an AC circuit to the product of the r.m.s. values of current and voltage. The difference between the two is caused by reactance in the circuit and represents power that does no useful work.	Remember	CO 5	CLO 14	AEE011.14
17	Define transmission system?	Electric-power transmission system is the system used for bulk transfer of electrical energy, from generating power plants to electrical substations located near demand centers.	Remember	CO 5	CLO 14	AEE011.14
18	Define distribution system?	The part of power system which distributes electric power for local use is known as Distribution System.	Remember	CO 5	CLO 14	AEE011.14
19	Describe about substation.	The assembly of apparatus used to change some characteristics	Remember	CO 5	CLO 14	AEE011.14

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		(e.g. voltage, AC to DC, frequency, power factor) of the electric supply is called a sub-station				
20	Describe the functioning of Indian electricity rules of 1956.	The Indian electricity rules of 1956 covers the inspection of electric installations, Licensing and general safety precautions.	Remember	CO 5	CLO 16	AEE011.16
21	What is the functioning of energy conservation act?	The Bureau of Energy Efficiency is an agency of the Government of India, under the Ministry of Power created in March 2002 under the provisions of the nation's 2001 Energy Conservation Act. The agency's function is to develop programs which will increase the conservation and efficient use of energy in India.	Remember	CO 5	CLO 16	AEE011.16
22	What is the colour of wires according to the Indian electricity rule act. 1956?	The different colour codes for wires used in india are as follows. Earth wire – Green Neutral wire – Black Phase wire – Red, Yellow, Blue	Remember	CO 5	CLO 16	AEE011.16
23	Which section in the IE Act deals with the 'theft of energy'?	Section 39 refers to the theft of electrical energy.	Remember	CO 5	CLO 16	AEE011.16
24	What does section 44 refer to Indian electricity rule?	Section 44 of Indian electricity rule refers to the Penalty for interference with the meters.	Remember	CO 5	CLO 16	AEE011.16
25	What are the voltage levels for generation?	Generating voltages may have 6.6KV, 3.3KV, 11KV, 21KV or 31KV. The amount of voltage generating depends on the insulation withstand level of the generator	Remember	CO 5	CLO 16	AEE011.16
26	What are the Transmission voltage levels?	The primary transmission voltages are 110KV, 132KV, 220KV and 400KV. Secondary transmission voltages are of the order of 11KV or 33KV. These transmission voltages are designed based on the distance to which power is to be delivered, amount of power to be transmitted and the system stability.	Remember	CO 5	CLO 16	AEE011.16
27	What are the distribution voltage levels?	The role of distribution station is to deliver power from substation to the consumer terminals. The Voltages of the primary distribution are 11, 6.6, or 3.3KV connected to bulk consumers (Industries). Secondary distribution voltage constitutes 415 or 230V.	Remember	CO 5	CLO 16	AEE011.16

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28	Describe the responsibility of Central Transmission Utility (CTU).	Power Grid Corporation of India Limited (PGCIL) is the Central Transmission Utility (CTU). CTU have the key responsibility of network planning and development based on the National Electricity Plan in coordination with all concerned agencies as provided in the Act. Section 38(2) of the Electricity Act	Remember	CO 5	CLO 16	AEE011.16
29	What is the total installed capacity of India.	As on the date 31.05.2019, the total power installed capacity in India is 3,56,818 MW	Remember	CO 5	CLO 16	AEE011.16
30	What is the contribution of renewable energy over total installed capacity as on 2019?	According to the MNRE the percentage of renewable energy contribution out of total installed capacity is 22 % as on 31.05.2019.	Remember	CO 5	CLO 16	AEE011.16

Signature of the Faculty

HOD, EEE

