MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)

Rasipuram - 637 408, Namakkal Dist., Tamil Nadu

MKC

MUST KNOW CONCEPTS

EEE | **2021-2022**

Course Code & Course Name : 19EEC10 & POWER SYSTEM ANALYSIS

Year/Sem : III/V

S.no	Term	Notation / Symbol	Concept/Definition/Meaning/Units/Equation/ Expression	Units
UNIT I - INTRODUCTION				
1.	Power system analysis	-	The evaluation of power system is called as power system analysis	-
2.	Functions of power system analysis	-	• To monitor the voltage at various buses, real and reactive power flow between buses. • To design the circuit breakers. • To plan future expansion of the existing system • To analyze the system under different fault conditions	-
3.	Divisions of power system	-	• Generation System • Transmission system • Distribution system	-
4.	Components of a power system	-	• Generators, • Power transformers, • Transmission lines, • Motor and • Loads	-
5.	Single line diagram	-	It is diagrammatic representation of power system in which the components are represented by their symbols and interconnection between them are shown by a straight line even though the system is three phase system	-
6.	Purpose of using single line diagram	-	The purpose of the single line diagram is to supply in concise form of the significant information about the system.	-
7.	Per unit value	P.u	Ratio of actual value of the quantity to base value of the quantity	-
8.	Need for base values	-	• The components or various sections of power system may operate at different voltage and power levels. • It will be convenient for analysis of power system if the	-

			voltage, power, current and impedance rating of components of power system are expressed with reference to a common value called base value	
9.	Loads impedance diagram	-	The combination of resistance and inductive reactance in series	-
10.	Compute the p.u. impedance	-	If the new base values are used to compute the p.u. impedance of a circuit element with impedance Z can be written as $Z_{p.u,new} = Z_{p.u.old} \frac{(kV_{b,old})^2}{MVA_{b,old}} \times \frac{MVA_{b,new}}{(kV_{b,new})^2}$	-
11.	Impedance diagrams	-	• Impedance diagrams is the simplified equivalent circuits of single line or one line diagrams of power system to analyze power flow and complex power system calculations. • The impedance diagram is used for load flow studies	-
12.	Approximation made in impedance diagram	-	• The neutral reactances are neglected. • The shunt branches in equivalent circuit of transformers are neglected	-
13.	Reactance diagram	-	• The reactance diagram can be obtained from impedance diagram if all the resistive components are neglected. • The reactance diagram is used for fault calculation	-
14.	Approximation made in reactance diagram	-	• The neutral reactances are neglected. • The shunt branches in equivalent circuit of transformers are neglected. • The resistances are neglected. • All static loads are neglected. • The capacitance of transmission lines are neglected.	-
15.	Bus	-	• The meeting point of various components in a power system	-
16.	Bus impedance matrix	Z_{bus}	• The matrix consisting of driving point impedances and impedances of the network of a power system is called bus impedance matrix.	-
17.	Bus admittance matrix	Y_{bus}	• The matrix consisting of the self and mutual admittances of the network of a power system is called bus admittance matrix. • It is given by the admittance matrix Y in the node basis matrix equation of a power system	-
18.	Equations of HV side	KV	$\text{Base kV on HT side of transformer} = \text{Base kV on LT side} \times \frac{\text{HT voltage rating}}{\text{LT voltage rating}}$	Kilo Volts
19.	Equations of LV side	KV	$\text{Base kV on LT side of transformer} = \text{Base kV on HT side} \times \frac{\text{LT voltage rating}}{\text{HT voltage rating}}$	Kilo Volts
20.	Bus admittance matrix	Y_{bus}	$Y_{jk,new} = Y_{jk} - \frac{Y_{jn} Y_{nk}}{Y_{nn}}$	-
21.	Base current	-	Base current is defined as the ratio of base power (MVA) to base voltage KV	$\frac{Base\ MVA}{Base\ KV}$

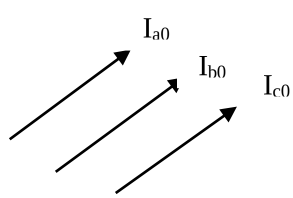
22.	Base impedance	-	$Base\ Impedance = \frac{(Base\ KV)^2}{Base\ MVA}$	-
23.	Per unit impedance	-	$Per\ unit\ impedance = \frac{Actual\ impedance}{Base\ impedance}$	-
24.	Four ways of adding impedance to an existing system so as to modify bus impedance matrix.	-	• Adding a branch of impedance z_b from a new bus-p to the reference bus. • Adding a branch of impedance z_b from a new bus-p to an existing bus-q. • Adding a branch of impedance z_b from an existing bus-q to the reference bus. • Adding a branch of impedance z_b between two existing buses h and q.	-
25.	Diagonal and off diagonal elements	-	The diagonal elements of bus admittance matrix are called self admittances of the buses and off-diagonal elements are called mutual admittances of the buses.	-
UNIT II –POWER FLOW ANALYSIS				
26.	Power flow study	-	The study of various methods of solution to power system network	-
27.	Power flow analysis	-	To calculate the Magnitude of voltage, Phase angle of voltage, Active power, Reactive in volt amperes	-
28.	Need for load flow study	-	It is essential to decide the best operation of existing system and for planning the future expansion of the system.	-
29.	Admittance matrix methods	-	• **Direct inspection method** -Form bus admittance matrix and take the inverse to get bus impedance matrix. • **Using bus building algorithm** - Singular transformation method(Primitive network) • **Using L-U factorization** of Y-bus matrix.	-
30.	Methods used for solution of load flow study	-	The Gauss seidal method, Newton Raphson method and Fast decouple methods.	-
31.	Quantities associated with each bus in a system	-	Each bus in a power system is associated with four quantities a) Real power (P), b) Reactive power (Q), c) Magnitude of voltage (V), and d) phase angle of voltage (δ)	-
32.	Types of bus	-	a) Slack or Swing or Reference bus b) Generator or Voltage control or PV bus c) Load or PQ bus	-
33.	Voltage controlled bus(Generator bus/PV bus)	-	A bus is called voltage controlled bus if the magnitude of voltage |V| and real power (P) are specified for it. In a voltage controlled bus, the magnitude of the voltage is not allowed to change.	-
34.	PQ bus (load bus)	-	A load bus when real and reactive components of power are specified for the bus. In a load bus, the voltage is allowed to vary within permissible limits	-

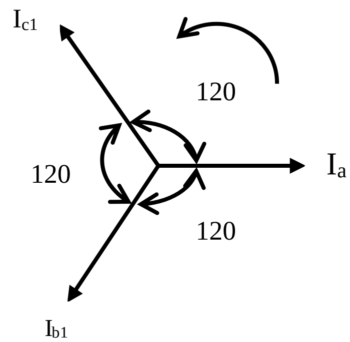
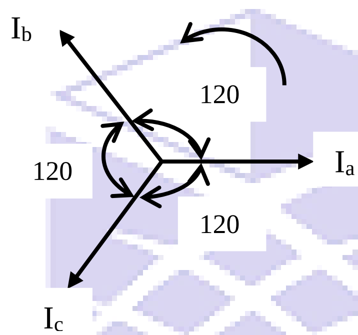
35.	Swing bus (slack bus/reference bus)	-	A swing bus when the magnitude and phase of bus voltage are specified for it. The swing bus is the reference bus for load flow solution and it is required for accounting for the line losses.	-
36.	Need for slack bus	-	• The slack bus is needed to account for transmission line losses. • In a power system the total power generated will be equal to sum of power consumed by loads and losses. • In a power system only the generated power and load power are specified for buses. • The slack bus is assumed to generate the power required for losses.	-
37.	Reason for Generator bus treated as load bus	-	If the reactive power constraints of a generator bus violates the specified limits then the generator is treated as load bus	-
38.	Advantages of Gauss serial method	-	Calculations are simple and so the programming task is lessees. The memory requirement is less. Useful for small systems .	-
39.	Disadvantages of Gauss serial method	-	Requires large no. of iterations to reach converge .Not suitable for large systems. Convergence time increases with size of the system	-
40.	Advantages of N.R method	-	Faster, more reliable and results are accurate, require less number of iterations;	-
41.	Disadvantages of N.R method	-	Program is more complex, memory is more complex	-
42.	Jacobian matrix	J	The matrix formed from the derivates of load flow equations is called Jacobian matrix and it is denoted by J	-
43.	Reason for iterative methods	-	The load flow equations are non linear algebraic equations and so explicit solution as not possible. The solution of non linear equations can be obtained only by iterative numerical techniques.	-
44.	Effect of acceleration factor	-	Acceleration factor is used in gauss seidal method of load flow solution to increase the rate of convergence. Best value of A.F=1.6	-
45.	Flat voltage start	-	In iterative methods of load flow solution, the initial voltage of all buses except slack bus are assumed as 1+j0 p.u. This is referred to as flat voltage start.	-
46.	Equation for power flow in the transmission line	-	The equation for power low in the transmission line (say p-q) at bus ‘p’ is given by, **Spq = Ppq-jQpq** = Ep * ipq = Ep * [Ep-Eq]Ypq + Ep * Ep.(Ypq’/2) **Sqp = Pqp-jQqp** = Eq * iqp = Eq * [Eq-Ep]Ypq + Eq * Eq.(Ypq’/2)	-
47.	Primitive network	-	• Primitive network is a set of unconnected elements which provides information regarding the characteristics of individual elements only. • The performance equations of primitive network are given below. V + E = ZI (In Impedance form) I + J = YV (In	-

			Admittance form) where V and I are the element voltage and current vectors respectively. • J and E are source vectors. Z and Y are the primitive Impedance and Admittance matrices respectively.	
48.	Bus incidence matrix	-	**$V = A\,V_{BUS}$** where A is the bus incidence matrix, which is a rectangular and singular matrix. Its elements are found as per the following rules. $a_{ik} = 1$, if i^{th} element is incident to and oriented away from the k^{th} node (bus). = -1, if i^{th} element is incident to but oriented towards the k^{th} node. = 0, if i^{th} element is not incident to the kth node.	-
49.	Equation to find the k^{th} bus voltage	-	$V_k = \frac{1}{\Delta}[\Delta_{1k} I_{11} + \Delta_{2k} I_{22} + \Delta_{3k} I_{33} + ... + \Delta_{nk} I_{nn}]$ $V_k = \frac{1}{\Delta} \sum_{j=1}^{n} \Delta_{jk} I_{jj}$ where Δ = Determinant of Y_{bus} matrix. Ijj = Sum of the currents injecting current to node j. **Δ_{jk} = Cofactor of the element Y_{jk} of bus admittance matrix.**	-
50.	Equation for the bus admittance matrix	-	The equation for bus admittance matrix is, **YbusV = I** where Ybus = Bus admittance matrix of order (n x n) V = Bus voltage matrix of order (n x1) I = Current source matrix of order (n x1) n = Number of independent buses in the system	-
UNIT III-FAULT ANALYSIS-BALANCED ANALYSIS				
51.	Fault	-	In an electric power system, a fault or fault current is any abnormal electric current.	-
52.	Reason for fault	-	Faults occur in a power system due to insulation failure of equipments, flashover of lines initiated by a lightening stroke, permanent damage to conductors and towers or accidental faulty operations	-
53.	Types of faults	-	• Series fault or open circuit fault • Shunt fault or short circuit fault	-
54.	Types of series faults	-	• One open conductor fault • Two open conductor fault	-
55.	Short circuit fault	-	Short circuit faults involve power conductor or conductors-to-ground or short circuit between conductors. These faults are characterized by increase in current and fall in voltage and frequency	-
56.	Types of Short circuit fault	-	• Symmetrical fault or balanced fault • Three phase fault • Unsymmetrical fault or unbalanced fault • Line to ground (L-G) fault • Line to Line (L-L) fault • Double line to ground (L-L-G) fault	-

57.	Need for short circuit studies	-	• Short circuit studies are essential in order to design or develop the protective schemes for various parts of the system . • To estimate the magnitude of fault current for the proper choice of circuit breaker and protective relays.	-
58.	Reactor	-	Reactor is a coil, which has high inductive reactance as compared to its resistance and is used to limit the short circuit current during fault conditions	-
59.	Causes of electrical faults	-	Electrical faults are also caused due to human errors such as selecting improper rating of equipment or devices, forgetting metallic or electrical conducting parts after servicing or maintenance, switching the circuit while it is under servicing	-
60.	Faults occurs in transmission lines	-	• Symmetrical faults • Unsymmetrical faults	-
61.	Need for fault analysis	-	• To determine the magnitude of fault current throughout the power system after fault occurs. • To select the ratings for fuses, breakers and switchgear. • To check the MVA ratings of the existing circuit breakers when new generators are added into aϖ system	-
62.	Classification of power system faults	-	Power system faults may be categorized as in order of frequency of occurrence • Single line to ground fault • Line to line fault • Double line to ground fault	-
63.	Symmetrical faults	-	The fault is called symmetrical fault if the fault current is equal in all the phases	-
64.	Unsymmetrical faults		The fault is called unsymmetrical fault if the fault current is not equal in all the phases	
65.	Fault calculations	-	Sub transient, transient and steady state periods.	-
66.	Sub-transient period	-	First cycle or after the fault – AC current is very large and falls rapidly	-
67.	Transient period	-	Current falls at a slower rate	-
68.	Steady-state period	-	Current reaches its steady value	-
69.	Short circuit capacity	-	It is the product of magnitudes of the prefault voltage and the post fault current. It is used to determine the dimension of a bus bar and the interrupting capacity of a circuitϖ breaker.	-
70.	Sub transient reactance	-	The synchronous reactance is the ratio of induced emf on no load and the sub transient symmetrical rms current.	-
71.	Methods of reducing short circuit current	-	✓ By providing neutral reactance ✓ By introducing a large value of shunt reactance between buses	-
72.	Transient reactance	-	The synchronous reactance is the ratio of induced emf on no load and the transient symmetrical rms current.	-

73.	Boundary conditions in line to line fault	-	Ia = 0 ; Ib + Ic = 0 ; Vb = V	-
74.	Boundary condition in double line to ground fault	-	Ia = 0 ; Vb = 0 ; Vc= 0	-
75.	Boundary condition for 3-phase fault.	-	Ia + Ib = Ic = 0 ; Va = Vb = Vc= 0	-
UNIT IV-FAULT ANALYSIS-UNBALANCED FAULTS				
76.	Symmetrical components	-	• Positive sequences components • Negative sequences components • zero sequences components	-
77.	Methods of improving the transient stability limit	-	• Reduction in system transfer reactance • Increase of system voltage and use AVR • Use of high speed excitation systems • Use of high speed reclosing breakers	-
78.	Single Line-to-Ground Fault	-	single line-to-ground fault on a transmission line occurs when one conductor drops to the ground or comes in contact with the neutral conductor.	-
79.	Reason for L.G fault	-	• Lighting • Conductors making contact with grounded structures like towers (or)poles etc,. • high-speed wind, falling off a tree, lightning, etc.	-
80.	Uses of short circuit capacity	-	Determining the dimension of a bus bar, and the interrupting capacity of a circuit breaker	-
81.	Sequence Impedance	-	The sequence impedances are impedances offered by the devices or components for the like sequence component of the current	-
82.	Sequence network	-	The single phase equivalent circuit of a power system consisting of impedances to the current of any one sequence only is called sequence network	-
83.	Positive Sequence Components	-	• The positive sequence components are equal in magnitude and displayed from each other by 120° with the same sequence as the original phases. • The positive sequence currents and voltages follow the same cycle order of the original source.	-
84.	Negative Sequence Components	-	• This sequence has components that are also equal in magnitude and displayed from each other by 120° similar to the positive sequence components. • However, it has an opposite phase sequence from the original system.	-
85.	Zero Sequence Components	-	In this sequence, its components consist of three phasors which are equal in magnitude as before but with a zero displacement. The phasor components are in phase with each other.	-
86.	Synchronous reactance	-	The synchronous reactance is the ratio of induced emf and the steady state rms current It is the sum of leakage reactance and the	-

			reactance representing armature reaction.	
87.	Subtransient reactance	-	The subtransient reactance is the ratio of induced emf on no-load and the subtransient symmetrical rms current.	-
88.	Transient reactance	-	The transient reactance is the ratio of induced emf on no-load and the transient symmetrical rms current.	-
89.	operator 'a'	-	An operator which causes a rotation of 120° in the anticlockwise direction is known as operator 'a'. The value of 'a' is $1\angle 120^{\circ}$	-
90.	Symmetrical currents from unbalanced currents	-	Let, I_a, I_b, I_c be the unbalanced phase currents Let, I_{a0}, I_{a1}, I_{a2} be the symmetrical components of phase *a* $\begin{bmatrix} I_{a0} \\ I_{a1} \\ I_{a2} \end{bmatrix} = \frac{1}{3}\begin{bmatrix} 1 & 1 & 1 \\ 1 & a & a^2 \\ 1 & a^2 & a \end{bmatrix}\begin{bmatrix} I_a \\ I_b \\ I_b \end{bmatrix}$	-
91.	Unbalanced currents from symmetrical currents	-	Let, I_a, I_b, I_c be the unbalanced phase currents Let, I_{a0}, I_{a1}, I_{a2} be the symmetrical components of phase *a* $\begin{bmatrix} I_a \\ I_b \\ I_b \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & a^2 & a \\ 1 & a & a^2 \end{bmatrix}\begin{bmatrix} I_{a0} \\ I_{a1} \\ I_{a2} \end{bmatrix}$	-
92.	Sequence operator	-	In unbalanced problem, to find the relationship between phase voltages and phase currents, we use sequence operator ***'a'***. $a = 1\angle 120^{\circ} = e^{j120} = -0.5 + j0.866$ $a^2 = 1\angle 240^{\circ} = -0.5 - j0.866$ $1 + a + a^2 = 0$	-
93.	Transient State	-	If a network contains energy storage elements, with change in excitation, the current and voltage change from one state to other state the behavior of the voltage or current when it is changed from one state to another state is called transient state.	-
94.	Transient Time	-	The time taken for the circuit to change from one steady state to another steady state is called transient time.	-
95.	Transient Response	-	The storage elements deliver their energy to the resistance; hence the response changes with time, get saturated after sometime, and are referred to the transient response.	-
96.	Unbalanced system	-	Neither the phase currents nor the phase voltage possess three – phase symmetry	-
97.	Zero sequence components equation	-	It consists of three phasors equal in magnitude and with zero phase displacement from each other.  $I_{a0} = I_{b0} = I_{c0}$	-

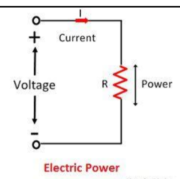
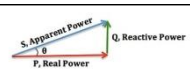
98.	Positive sequence components equation	-	It consists of three components of equal magnitude, displaced each other by 120˚ in phase and having the phase sequence *abc*  $I_{a1} = I_{a1}\angle 0^{\circ}$ $I_{b1} = I_{a1}\angle 240^{\circ} = I_{a1}\angle -120^{\circ}$ $I_{c1} = I_{a1}\angle 120^{\circ}$	-
99.	Negative sequence components equation	-	 $I_{a2} = I_{a2}\angle 0^{\circ}$ $I_{b2} = I_{a2}\angle 120^{\circ}$ $I_{c1} = I_{a2}\angle 240^{\circ} = I_{a2}\angle -120^{\circ}$	-
100.	Phase Current	-	The current flowing through the phase is called phase current.	-
UNIT V- POWER STABILITY				
101.	Stability	-	The stability of a system is defined as the ability of power system to return to stable (synchronous) operation when it is subjected to a disturbance.	-
102.	Disturbance	-	If a sudden change or sequence of changes occurs in one or more of the system parameters or one or more of its operating quantities, the system is said to have undergone a disturbance from its steady state operating condition.	-
103.	Types of disturbances	-	a) Large disturbance b) Small disturbance	-
104.	Small disturbance	-	If the power system is operating in a steady state condition and it undergoes change, which can be properly analyzed by linearized versions of its dynamic and algebraic equations, a small disturbance is said to have occurred.	-
105.	Example of small disturbance	-	Example of small disturbance is a change in the gain of the automatic voltage regulator in the excitation system of a large generating unit	-
106.	Large disturbance	-	A large disturbance is one for which the nonlinear equations describing the dynamics of the power system cannot be validly linearized for the purpose of analysis	-
107.	Examples of large disturbances	-	Examples of large disturbances are transmission system faults, sudden load changes, loss of generating units and line switching.	-

108.	Classification of stability	-	a) Steady state stability b) Dynamic stability c) Transient stability	-
109.	Steady state stability	-	Ability of the power system to regain synchronism after small and slow disturbances	-
110.	Dynamic stability	-	Ability of the power system to regain synchronism after small disturbances occurring for a long time	-
111.	Transient stability	-	This concern with sudden and large changes in the network conditions i.e sudden changes in application or removal of loads, line switching operating operations, line faults, or loss of excitation.	-
112.	Steady state limit	-	Steady state limit is the maximum power that can be transferred without the system become unstable when the load in increased gradually under steady state conditions.	-
113.	Transient limit	-	Transient limit is the maximum power that can be transferred without the system becoming unstable when a sudden or large disturbance occurs.	-
114.	Equal area criterion	-	In a two machine system under the usual assumptions of constant input, no damping and constant voltage being transient reactance, the angle between the machines either increases or else, after all disturbances have occurred oscillates with constant amplitude. There is a simple graphical method of determining whether the system comes to rest with respect to each other. This is known as equal area criterion	-
115.	Critical clearing angle	-	The critical clearing angle δ_{cc} is the maximum allowable change in the power angle δ before clearing the fault, without loss of synchronism.	-
116.	Critical clearing time	-	The critical clearing time t_{cc} can be defined as the maximum time delay that can be allowed to clear a fault without loss of synchronism. The time corresponding to the critical clearing angle is called critical clearing time	-
117.	Methods of improving the transient stability limit	-	• Increase of system voltage and use of AVR • Use of high speed excitation systems. • Reduction in system transfer reactance. • Use of high speed reclosing breakers	-
118.	Power-angle equation	-	$P_e = P_{max} \sin\delta$ Where, $P_{max} = \|E\|\|V\| / X$	-
119.	Infinite bus	-	The single small machine on a large system would not affect the magnitude and phase of the voltage and frequency. Such a system of constant voltage and constant frequency regardless of the load is called infinite bus bar system or infinite bus	-
120.	power angle	-	The power angle (or torque angle) is defined as the angular displacement of the rotor from synchronously rotating reference time	-
121.	SMIB	-	Single machine connected to an infinite bus bar	-
122.	swing equation for a SMIB	-	$\left[\left(\frac{H}{\Pi f}\right)\left(\frac{d^2\delta}{dt^2}\right)\right] = P_m - P_e$	-

			Since M in p.u = H/πf $M\frac{d^2\delta}{dt^2} = P_m - P_e$ Where H = inertia constant in MW/MVA	
123.	power angle equation	--	$P = \frac{V_s V_r}{X_T} \sin\delta$ Where, P – Real Power in watts V_s – Sending end voltage; V_r- Receiving end voltage X_T - Total reactance between sending end receiving end δ - Rotor angle	-
124.	causes of voltage instability	-	A system enters a state of voltage instability when a disturbance, increase in load demand, or change in system condition causes a progressive and uncontrollable drop in voltage The main factor causing instability is the inability of the power system to meet the demand for reactive power.	-
125.	swing curve	-	The swing curve is the plot or graph between the power angle δ and time t. From the nature of variations of δ the stability of a system for any disturbance can be determined.	-

Placement Questions

126.	Power	P	Power is the rate of change of energy.	Watts
127.	Energy	E	Energy is defined as the capacity of a physical system to perform work.	Joules
128.	Capacitor	C	Capacitor stores energy in the form of an electrostatic field between its plates.	No Unit
129.	Current	I	Current can be defined as the motion of charge through a conducting material. The unit of current is Ampere whilst charge is measured in Coulombs.	Ampere
130.	Inductor	L	An **inductor** is a passive electrical device employed in electrical circuits for its property of inductance. An inductor can take many forms.	Henry
131.	Ampere	-	The quantity of total charge that passes through an arbitrary cross-section of a conducting material per unit second is defined as an Ampere.	-
132.	Ohm's Law	-	Ohm's law states that the voltage or potential difference between two points is directly proportional to the current or electricity passing through the resistance, and inversely proportional to the resistance of the circuit.	-
133.	Mesh	-	A closed path electrical path	-
134.	Node	-	Junction of three or more elements.	-
135.	Resistor	-	Resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines.	-
136.	Real Power	P_R	**Real power** (P), also known as true or active power, performs the "real work" within an electrical circuit	Watts
137.	Reactive Power	P_Q	The power consumed in an AC circuit that does not perform any useful work but has a big effect on the phase shift between	Watts

			the voltage and current waveforms.	
138.	Apparent Power	P_A	We have seen above that real power is dissipated by resistance and that reactive power is supplied to a reactances.	Watts
139.	RMS voltage	V_{rms}	R.M.S value is defined as the square root of means of squares of instantaneous values. $V_{rms} = V_{eff} = V_{max} / \sqrt{2} \approx 0.707\ V_{max}$	volts (V)
140.	Average value	-	The average of all the instantaneous values of an alternating voltage and currents over one complete cycle is called Average Value. $I_{av} = \frac{i_1 + i_2 + i_3 + \dots\dots\dots + i_n}{n} = \frac{\text{Area of alternation}}{\text{Base}}$	No Unit
141.	Form factor	-	In electronics or electrical the form factor of an alternating current waveform (signal) is the ratio of the RMS (root mean square) value to the average value (mathematical mean of absolute values of all points on the waveform)	No Unit
142.	Peak value	-	The maximum value attained by an alternating quantity during one cycle is called its Peak value.	E_m
143.	Power		Electric power is the rate, per unit time, at which electrical energy is transferred by an electric circuit.	Watts
144.	Power Factor	-	power factor of an AC electrical power system is defined as the ratio of the *real power* absorbed by the load to the *apparent power* flowing in the circuit	CosΦ
145.	Power triangle		S=P+jQ	No Unit
146.	Peak Factor	-	The peak factor of any wave form is defined as the ratio of the peak value of the wave to the RMS value of the wave. Peak factor = Max.Value/ RMS Value. (V_m / V_{rms})	-
147.	Form Factor	-	It is defined as the ratio of RMS value to the average value of the wave. Form factor = RMS value / Avg. Value. For a sinusoidal wave, Form factor = 1.11	-
148.	Line Current	-	The current flowing through the line is called line current.	-
149.	Ampere turns	MMF	MMFA coil of N turns carrying a current I amps gives an mmf of NI ampere turns In a vacuum, a magnetizing force of 1 ampere turn / metre produces a magnetic field of 1.26×10^{-6} tesla.	Volts
150.	Line Voltage	-	The voltage between two lines is called the line voltage.	-

Faculty Team Prepared **Signatures**

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HoD