SHMBHUNATH INSTITUTE OF ENGINEERING & TECHNOLOGY, JHLAWA, PRAYAGRAJ
DEPARTMENT OF ELECTRICAL ENGINEERING
LESSON PLAN

ACADEMIC YEAR: 2020-21   **DATE OF ISSUE: November, 2020**
SEMESTER-1

SUBJECT: BASIC ELECTRICAL ENGINEERING
SUBJECT CODE- KEE101T

TEACHER'S NAME: Mr. AJEET KUMAR RAWAT

Unit	Topic	Lecture No
1	**Basic Concept of Electricity**	**L1**
	Concept of Resistance	**L2**
	Concept of Inductance and Capacitance	**L3**
	What is Linear elements and Linear Networks	**L4**
	Definition of Active and Passive elements, network and Bilateral and Unilateral element, network	**L5**
	Concept of loop and mesh, Introduction to KVL and mesh analysis method	**L6**
	Numerical problems based on Mesh analysis method	**L7**
	Concept and numerical based on Super mesh	**L8**
	Concept of Node, Introduction to KCL and Nodal analysis method	**L9**
	Numerical problems based on Nodal Analysis method	**L10**
	Introduction of Star-delta transformation technique and numerical problems based on it	**L11**
	Statement of Superposition theorem with concept	**L12**
	Numerical problems on Superposition Theorem	**L13**
	Statement and explanation of Thevenin's theorem with examples	**L14**
	Numerical problems based on Thevenin's theorem	**L15**
	Statement and explanation of Norton's Theorem with examples	**L16**
	Numerical problems on Norton's Theorem	**L17**
2	**Generation of Single phase ac emf**	**L18**
	Concept of Sinusoidal waveform (voltage and current) : Average or Mean value	**L19**
	Concept of Sinusoidal waveform (voltage and current) : Effective or RMS value, form factor, peak factor	**L20**
	Numerical problems based on Average value, RMS value, form factor and peak factor	**L21**
	Concept of drawing phasor diagram of sinusoidal voltage and current with numerical problems	**L22**
	Analysis of Purely Resistive Circuit	**L23**
	Analysis of purely inductive and capacitive circuit	**L24**
	Analysis of Series R-L circuit	**L25**
	Discussion over Series R-L circuit: Concept of Active, Reactive and Apparent power, Quality factor	**L26**
	Numerical Problems	**L27**
	Analysis of Series R-C and Series R-L-C circuit	**L28**
	Numerical Problems	**L29**
	Concept of Power factor and its improvement	**L30**
	Discussion over Parallel AC Circuit: Concept of Complex representation of Impedance, concept of admittance, with numerical problems	**L31**
	Concept of Resonance in Series R-L-C circuit	**L32**
	Derivation of Bandwidth, Cut-off frequencies	**L33**
	Derivation of Quality factor in Series Resonance, Numerical Problem based on Series resonance	**L34**
	Concept of Resonance in parallel AC circuit	**L35**

	Discussion on Current in case of Parallel resonance, Dynamic Impedance	**L36**
	Derivation of Quality factor in Parallel resonance	**L37**
	Numerical Problems	**L38**
	Three-phase balanced supply, three phase voltage and currents	**L39**
	Types of 3-phase load connections, derivation of voltage and current relation in star and delta connection	**L40**
3	Types of Magnetic Material and their theory	**L41**
	Concept of B-H characteristics and how to draw it, what does its significance	**L42**
	Introduction to the concept of Transformer Working: its working principle, its working	**L43**
	Types of Transformer, Concept of Ideal transformer, Derivation of EMF equation of transformer	**L44**
	Numerical Problems	**L45**
	Concept of Practical Transformer and Explanation of Equivalent circuit of transformer	**L46**
	Numerical Problems	**L47**
	Losses in transformer, Introduction of OC and SC test, How to calculate efficiency of transformer	**L48**
	Concept of voltage regulation, its formulae and numerical problem based over it	**L49**
	Introduction of an Auto transformer and its applications	**L50**
	Introduction of 3-phase transformer and its connection	**L51**
4	Construction of DC Machine, introduction of armature winding, commutator, brushes	**L52**
	DC generator: Working principle, its types, derivation of emf equation	**L53**
	DC generator derivation of emf equation, numerical problems	**L54**
	DC Motor: Working principle, concept of back emf, its types	**L55**
	DC Motor: derivation of torque equation, numerical problems	**L56**
	Introduction of three-phase induction motor, its working principle, construction and types, concept of slip	**L57**
	Three-phase induction motor: Formulae of Torque, Torque-slip characteristics	**L58**
	Application of 3-phase induction motor and simple numerical problems	**L59**
	Single-phase induction motor: Introduction, why it is not self starting, how to make itself start	**L60**
	Single-phase induction motor: Double Revolving field theory, Types and method of starting	**L61**
	Working of 3-phase Alternator with its construction, Working of 3-phase synchronous motor and why it is not self starting	**L62**
	Starting method of synchronous motor and their applications	**L63**
5	Introduction of Switch Fuse unit, MCB, ELCB, MCCB	**L64**
	Types of wires and Cables	**L65**
	What is earthing and its important	**L66**
	Types of Batteries and characteristics of batteries	**L67**
	Concept of Battery Back-up, How to calculate energy consumption and energy savings	**L68**

S.N	Reference Books
1.	J.B. Gupta, "Basic Electrical Engineering", Katson Books
2.	B.L Theraja, "A Text Book of Electrical Technology Vol-I", S.Chand Technical
3.	U.A. Bakshi, "Basic Electrical Engineering", Technical Publication
4.	B.L. Theraja, "ABC of Electrical Engineering", S.Chand Technical
5.	V.D. Toro, "Electrical Engineering Fundamentals", Pearson India