Lesson plan

Name of Faculty	Guest Faculty
Discipline	Electrical Engineering
Year	1st
Subject	Fundamental of Electrical & Electronics Engg.
Lesson Plan Duration	2020-21
Work load [Theory + Practical] Per Week	[02+02]

Week	Day	Theory Topic/ Assignment/ Test	Practical Day	Topic
1	1	**1 Overview of DC Circuits**	Day 1	Operation and use of electrical measuring instruments and other accessories
	2	Simple problems on series and parallel combination of resistor and capacitors		
2	1	Kirchhoff's current law and Kirchhoff's voltage law	Day 1	File Checking and revision
	2	Star – Delta connections and their conversion		
3	1	**2 DC Circuit Theorems**Thevenin's theorem and problems	Day 1	Measurement of resistance of an ammeter and a voltmeter
	2	Norton's theorem and problems		
4	1	Superposition nodal analysis and problems	Day 1	File Checking and revision
	2	Mesh analysis and problems		
5	1	Maximum Power Transfer and problems	Day 1	Verification of following Theorems Thevenin's theorem
	2	**3 Voltage and Current Sources**		
6	1	voltage source, symbol and graphical representation	Day 1	Norton's theorem
	2	characteristics of ideal and practical sources		
7	1	current sources, symbol, characteristics	Day 1	File Checking and revision
	2	First Internal		
8	1	**4 Semiconductor Physics**, basic atomic structure and energy levels	Day 1	First Internal evaluation
	2	concept of insulators, conductors and semi-conductors		
9	1	structure of (Ge) and (Si) covalent bonds, Intrinsic, extrinsic semiconductor and doping	Day 1	Observation of change in resistance of a bulb in hot and cold conditions, using voltmeter and ammeter
	2	Energy level diagram of conductor, insulator and semiconductor		
10	1	P and N type semiconductors and their conductivity, effect of temperature	Day 1	File Checking and revision
	2	**5 Semiconductor Diode**, PN junction diode, forward and reverse biased PN junction, drift and diffusion currents		
11	1	V-I characteristics, static and dynamic resistance	Day 1	Verification of Kirchhoff's Current and Voltage Laws in a dc circuit
	2	Application of diode as half-wave, full wave and bridge rectifiers		
12	1	Peak Inverse Voltage, rectification efficiencies and ripple factor calculations	Day 1	File Checking and revision
	2	shunt capacitor filter, series inductor filter, LC and π filters		
13	1	Types of diodes, characteristics and applications of Zener diodes	Day 1	To find the ratio of inductance of a coil having air-core and iron-core respectively and to observe the effect of introduction of a magnetic core on coil inductance
	2	Revision of syllabus / Second Internal		
14	1	**6 Electro Magnetic Induction**, flow of electric current, magnetic circuit, concept (MMF)	Day 1	File Checking and revision
	2	flux, reluctance, permeability, analogy between electric and magnetic circuit		
	1	Faraday's laws of electro-magnetic induction	Day 1	Second Internal evaluation

15	2	self and mutual induction, self and mutually induced e.m.f simple numerical problems		
16	1	current growth, decay and time constant in an inductive (RL) circuit	Day 1	Charging and testing of a lead - acid storage battery
	2	Energy stored in an inductor, series and parallel combination of inductors		
17	1	**7 Batteries**Basic idea of primary and secondary cells Construction, working principle and applications of Lead-Acid	Day 1	File Checking and revision
	2	Nickel-Cadmium and Silver-Oxide batteries		
18	1	Charging methods used for lead-acid battery (accumulator), Care and maintenance of lead-acid battery	Day 1	Measurement of power and power factor in a single phase RLC circuit and calculation of active and reactive powers in the circuit.
	2	Series and parallel connections of batteries, General idea of solar cells,		
19	1	solar panels and their applications, Introduction to maintenance free batteries	Day 1	Plotting of V-I characteristics of a PN junction diode & Zener diode
	2	**8 AC Fundamentals** ,Concept of alternating quantities , Difference between ac and dc		
20	1	Concepts of: cycle, frequency, time period, amplitude, instantaneous value	Day 1	File Checking and revision
	2	average value, r.m.s. value,		
21	1	Maximum value, form factor and peak factor.	Day 1	Observe the output of waveform using a.) Half-wave rectifier circuit using one diode
	2	Representation of sinusoidal quantities by phasor diagrams.		
22	1	Equation of sinusoidal wave form for an alternating quantity and its derivation	Day 1	b.) Full-wave rectifier circuit using two diodes
	2	Effect of alternating voltage applied to a pure resistance		
23	1	Pure inductance and pure capacitance.	Day 1	c.) Bridge-rectifier circuit using four diodes
	2	**9 AC Circuits** , Concept of inductive and capacitive reactance		
24	1	Alternating voltage applied to resistance and inductance in series.	Day 1	File Checking and revision
	2	Alternating voltage applied to resistance and inductance in series.		
25	1	Introduction to series and parallel resonance and its conditions	Day 1	Plotting of the wave shape of full wave rectifier with a. Shunt capacitor filter
	2	Power in pure resistance, inductance and capacitance, power in combined RLC circuits		
26	1	Power factor, active and reactive power and their significance, definition and significance of power factor	Day 1	b. Series inductor filter
	2	Definition of conductance, susceptance, admittance, impedance and their units		
27	1	**10 Introduction to Bipolar-Transistors** PNP and NPN transistors , CB and CE and CC configurations	Day 1	File Checking and revision
	2	Comparison of CB, CE and CC Configurations		
28	1	Transistor as an amplifier in CE Configuration	Day 1	Plotting of input and output characteristics and calculation of parameters of transistors in CE configuration
	2	concept of DC load line and calculation of current gain and voltage gain using DC load line		
29	1	**11 Transistor Biasing Circuits**, Concept of transistor biasing and selection of operating point	Day 1	File Checking and revision
	2	Need for stabilization of operating point. Different types of biasing circuits.		
	1	**12 Field Effect Transistors**, Construction,	Day 1	Plotting of input and output

30		operation and characteristics		characteristics and calculation of parameters of transistors in CB configuration
	2	Construction, operation and characteristics of a MOSFET in depletion and enhancement modes		
31	1	CMOS - advantages and applications	Day 1	File Checking and revision
	2	Comparison of JFET, MOSFET and BJT		
32	1	**13 Introduction to Electrical Machines** Principal of operation, construction of Transformers	Day 1	Plotting of V-I characteristics of a FET
	2	single phase transformer, turns ratio , efficiency, loses in a transformer		
33	1	Principal of operation, construction of DC motor and generator, Characteristics of different types of DC machines, Starter	Day 1	To determine the efficiency of single phase Transformer
	2	AC machines : Principal and working of synchronous machines		
34	1	Single phase induction motor	Day 1	File Checking and revision
	2	Revision and final assessment		
35	1	Revision/Hsbte Old Question Paper	Day 1	Final evaluation
	2	Revision/Hsbte Old Question Paper		