**Lesson Plan**

**Name of Faculty :- POONAM SHARMA**

**Discipline :- Electrical Engineering**

**Semester :- Ist Semester**

**Subject :- PRINCIPALS OF ELECTRICAL ENGG**

**Lesson Plan Duration:- 15 Week**

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| **Week** | **Theory** | | **Practical** | |
| **1st** | **Lecture Day** | **Topic** | **Practical Day** | **Topic** |
| **1st** | 1.1 Nature of Electricity, Charge, free electrons, Electric potential and potential  difference, Electric current, Electrical Energy, Electrical power and their unit. | **1st** | 1. Familiarization of basic components/equipment like ammeter, voltmeter, watt meter,  resistance, capacitor, inductor, energy meter, power factor meter, CRO, multi-meter etc  and their operation, uses . |
| **2nd** | 1.2 Resistance: Definition, Unit, Laws of resistance, conductivity and resistivity, Effect of  temperature on resistance, Temperature coefficient of resistance, Types of resistance  & their applications, Color coding of resistance. |
| **3rd** | 1.3 Rating and wattages of Electrical appliances, heating effect of Electrical current. | **2nd** | 1. Familiarization of basic components/equipment like ammeter, voltmeter, watt meter,  resistance, capacitor, inductor, energy meter, power factor meter, CRO, multi-meter etc  and their operation, uses . |
| **2nd** | **1st** | 1.4 Introduction to Capacitors, capacitance, Variable capacitor, Factors affecting  capacitance of a capacitor. | **1st** | 2. Determine the value of resistance using colour coding method. |
| **2nd** | 1.5 Capacitance of parallel plate capacitor |
| **3rd** | 1.6 Grouping of capacitors: capacitors in series, parallel, series-parallel. | **2nd** | 2. Determine the value of resistance using colour coding method. |
| **3rd** | **1st** | 1.7 Energy stored in capacitor, Charging and discharging of a capacitor. |  | 3. Observation of change in resistance of a bulb in hot and cold conditions, using voltmeter  and ammeter. |
| **2nd** | REVISION assignment |
| **3rd** | REVISION CW checking | **2nd** | 3. Observation of change in resistance of a bulb in hot and cold conditions, using voltmeter  and ammeter. |
| **4th** | **1st** | **UNIT II**  **DC Circuits**  2.1 Ohm's law with practical implementation. | **1st** | 4. To charge and discharge a capacitor and to show the graph on C.R.O. |
| **2nd** | 2.2 Definition of DC circuit, types of DC circuits: series circuit, parallel circuit, seriesparallel  circuit. |
| **3rd** | 2.3 Concept of voltage source & current source, connections and their conversions, | **2nd** | 4. To charge and discharge a capacitor and to show the graph on C.R.O. |
| **5th** | **1st** | 2.3 Wheatstone Bridge. | **1st** | 5. Verification of laws of capacitors in series and parallel |
| **2nd** | 2.4 Kirchhoff’s Laws-KVL and KCL. |
| **3rd** | 2.5 Star – Delta connections and their conversion. | **2nd** | 6. To verify ohm's law by drawing a graph between voltage and current. |
| **6th** | **1st** | REVISION assignment | **1st** | 6. To verify ohm's law by drawing a graph between voltage and current. |
| **2nd** | **UNIT III**  **Electrostatics & Magnetostatics**  3.1 Concepts of Electrostatics, Coulomb’s law. |
| **3rd** | 3.2 Concept of magnetism, Magnetic field, Magnetic lines of force | **2nd** | 7. Verification of Kirchhoff’s Current Law in a dc circuit. |
| **7th** | **1st** | 3.3 Definition of Electromagnetism, magnetic effect of electric current, direction of  magnetic field and current: right hand rule, right hand cork screw rule. | **1st** | 7. Verification of Kirchhoff’s |
| **2nd** | 3.4 Magnetic field due to circular coil, solenoid, |
| **3rd** | 3.5 Current carrying conductors in a magnetic field and methods to find its direction,  applications. | **2nd** | 8. Verification of Kirchhoff’s Voltage Laws in a dc circuit. |
| **8th** | **1st** | 3.6 Force between two parallel current carrying conductors. Analogy between electric  and magnetic circuit. Definition of Magnetic circuit | **1st** | 9. Measurement of current and voltage in series resistive circuit. |
| **2nd** | terms related to magnetic  circuits: magneto-motive force (MMF), flux, magnetic flux density, reluctance,  permeability, field intensity, relation between magnetic flux density, permeability,  field intensity. |
| **3rd** | Revision assignment | **2nd** | 9. Measurement of current and voltage in series resistive circuit. |
| **9th** | **1st** | Revision ,cw checking | **1st** | 10. Measurement of current and voltage in parallel resistive circuit. |
| **2nd** | **UNIT IV**  **Electro-Magnetic Induction**  4.1 Determination of Ampere Turns, Series & parallel magnetic circuits, |
| **3rd** | Concept of  magnetic leakage, useful flux & Air Gap. | **2nd** | 11. To find the ratio of inductance of a coil having air-core and iron-core respectively and  to observe the effect of |
| **10th** | **1st** | 4.2 Magnetic curve (B-H curve) - cause of Hysteresis, Hysteresis loss, significance of  Hysteresis loss, magnetic hysteresis loop for hard and soft magnetic materials. | **1st** | 12. Verification of Faraday's law of electromagnetic induction.  **-** |
| **2nd** | 4.3 Faraday’s laws of electro-magnetic induction. |
| **3rd** | 4.4 Direction of Induced emf and current: Lenz’s law, Fleming’s right Hand rule | **2nd** | 12. Verification of Faraday's law of electromagnetic induction.  **- do--** |
| **11th** | **1st** | 4.5 E.M.F induced in a conductor: Dynamically induced emf, Statically induced emf: Selfinduced  emf and Mutual induced emf, Expression for self-inductance, mutual  inductance. | **1st** | 13. To obtain BH curve of a magnetic material. |
| **2nd** | 4.6 Energy stored in an Inductor, Eddy currents, Eddy current losses. |
| **3rd** | REVISION | **2nd** | 14. Demonstration of parts of a battery and find the specific gravity of battery. |
| **12th** | **1st** | **UNIT V**  **Batteries**  5.1 Electrolysis, Faradays law of electrolysis, important terms related to electrolysis,  electroplating. | **1st** | 14. Demonstration of parts of a battery and find the specific gravity of battery. |
| **2nd** | 5.2 Concept of Cell: definition, emf of cell, internal resistance of cell, terminal potential of  cell, types of cell (primary and secondary cell), grouping of cell (series grouping, parallel  grouping, series-parallel grouping). |
| **3rd** | 5.3 Concept of Battery: Definition, types of battery like Lead-Acid, Nickel-Cadmium, | **2nd** | 15. Demonstration of charging and discharging of Battery and measure the terminal voltage  during charging and discharging condition. |
| **13th** | **1st** | Lithium ion batteries with their Construction, working principle and applications | **1st** | 15. Demonstration of charging and discharging of Battery and measure the terminal voltage  during charging and discharging condition. |
| **2nd** | 5.4 Charging methods of storage battery and charging indications. |
| **3rd** | 5.5 Characteristics of battery: voltage, capacity, efficiency  5.6 Care and maintenance of battery | **2nd** | REVISION PRACTICAL |
| **14th** | **1st** | 5.7 Introduction to maintenance free batteries.  5.8 Disposal of batteries | **1st** | REVISION PRACTICAL |
| **2nd** | REVISION |
| **3rd** | REVISION | **2nd** | REVISION PRACTICAL |
| **15th** | **1st** | REVISION | **1st** | REVISION PRACTICAL |
| **2nd** | REVISION |
| **3rd** | REVISION | **2nd** | REVISION PRACTICAL |