| Lesson Plan | |
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| **Name of Faculty** | Ms. Pinki |
| **Discipline** | Electrical Engineering |
| **Semester** | 4th |
| **Subject** | Digital Electronics |
| **Lesson Plan Duration** | 14 Week (From March 2023 to june 2023) Theory - 04, Practical - 02 |

| **Week** | **Theory** | | **Practical** | |
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| | **Lecture day** | **Topic (Including Assignment/ Test)** | **Practical day** | **Topic** |
| 1st | Day1 | **1: Number Systems** | Day 1 | Verification and interpretation of truth table for AND, OR, |
| | Day2 | Decimal, binary | | |
| | Day3 | octal and hexa-decimal number systems | | |
| | Day4 | and their inter-conversion | | |
| 2nd | Day1 | Numerical based on inter-conversion | Day 1 | NOT, NAND, NOR, X-OR gates |
| | Day2 | Binary and Hexadecimal addition | | |
| | Day3 | subtraction and multiplication | | |
| | Day4 | 1's and methods of addition/subtraction | | |
| 3rd | Day1 | 2's complement | Day 1 | Revision and checking |
| | Day2 | Numericals/problems | | |
| | Day3 | Numericals/problems | | |
| | Day4 | **2:Gates** ;Definition, symbol and truth tables for inverter, OR, | | |
| 4th | Day1 | AND, NAND | Day 1 | Construction of Half Adder using gates |
| | Day2 | NOR and X-OR and | | |
| | Day3 | equivalence circuit (Ex. NOR) | | |
| | Day4 | Revision/assignment | | |
| 5th | Day1 | Class test | Day 1 | Construction of Full Adder using gates |
| | Day2 | **3:Boolean Algebra** ; Boolean Relations and their applications | | |
| | Day3 | De Morgan's Theorems | | |
| | Day4 | K-Map for two variables | | |
| 6th | Day1 | k-map for 4 variable | Day 1 | Revision and checking |
| | Day2 | Numerical based on k-map | | |
| | Day3 | Numerical based on k-map | | |
| | Day4 | **4:Combinational Circuits** | | |
| 7th | Day1 | Half adder with explanation | Day 1 | To verify the truth table for JK flipflop |
| | Day2 | Full adder | | |
| | Day3 | Encoder | | |
| | Day4 | Decoder | | |
| 8th | Day1 | Multiplexer/Demultiplexer | Day 1 | Revision and checking |
| | Day2 | Display Devices (LED, LCD | | |
| | Day3 | and 7-segment display) | | |
| | Day4 | Revision/assignment | | |

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| 9th | Day1 | Class test | Day 1 | Construction and testing of any counter |
| | Day2 | **5:Flip-Flops;** J-K Flip-Flop | | |
| | Day3 | R-S Flip-Flop | | |
| | Day4 | D-Type Flip-Flop | | |
| 10th | Day1 | T-Type Flip-Flop | Day 1 | Quiz and assessment |
| | Day2 | Applications of Flip-Flops | | |
| | Day3 | Revision/assignment | | |

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| | Day4 | Class test | | |
| 11th | Day1 | **6: Introduction of Shift Registers and Counters** | Day 1 | Verification of operation of a 8-bit D/A Converter |
| | Day2 | With types | | |
| | Day3 | and Counters | | |
| | Day4 | With types | | |
| 12th | Day1 | Revision/assignment | | |
| | Day2 | Class test | Day 1 | Revision and checking |
| | Day3 | **7: A/D and D/A Converters** | | |
| | Day4 | A/D converter (Counter ramp | | |
| 13th | Day1 | successive approximation method of A/D Conversion) | Day 1 | Revision and checking |
| | Day2 | D/A converters (Binary weighted | | |
| | Day3 | R-2R D/A Converter) | | |
| | Day4 | Revision/assignment | | |
| 14th | Day1 | Class test | Day 1 | Quiz and revision |
| | Day2 | **8: Semi-conductor Memories** | | |
| | Day3 | With its Types | | |
| | Day4 | merits, demerits, | | |
| 15th | Day1 | and applications | Day 1 | Revision and checking |
| | Day2 | Revision/assignment | | |
| | Day3 | Class test | | |
| | Day4 | Revision/Review/Test of old HSBTE Papers | | |
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**Lesson Plan**

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| **Name of the Faculty** | | Sh. Parveen Mehra |
| **Discipline** | | Electrical Engineering |
| **Semester** | | 4th |
| **Subject** | | EEDD-II |
| **Lesson Plan Duration** | | 14 Week (From March2023 toJune2023) Practical : 06 |
| **Week** | **Practical** | |
| | **Day** | **Topic** |
| 1st | Day 1 | **1:Contractor Control Circuits** ,Design of circuit drawing of schematic diagram and power wiring diagram of following circuits, specification of contactors |
| | Day 2 | DOL starting of 3-phase induction motor : sheet |
| 2nd | Day 1 | 3-phase induction motor getting supply from selected feeder :Sheet |
| | Day 2 | Revision and sheet check |
| 3rd | Day 1 | Forwarding/reversing of a 3-phase induction motor: sheet |
| | Day 2 | Two speed control of 3-phase induction motor: sheet |
| 4th | Day 1 | Revision and sheet check |
| | Day 2 | Limit switch control of a 3-phase induction motor: Sheet |
| 5th | Day 1 | Sequential operating of two motors using time delay relay: sheet |
| | Day 2 | Revision and sheet check |
| 6th | Day 1 | Manually generated star delta starter for 3-phase induction motor: sheet |
| | Day 2 | Automatic star delta starter for 3-phase Induction Motor: sheet |
| 7th | Day 1 | Revision and sheet check |
| | Day 2 | Revision and sheet check |
| 8th | Day 1 | **2: Earthing** Concept and purpose of earthing |
| | Day 2 | Different types of earthing, drawings of plate: sheet |
| 9th | Day 1 | Pipe earthing: sheet |
| | Day 2 | Procedure of earthing, test of materials required and costing |
| 10th | Day 1 | Method of reducing earth resistance |
| | Day 2 | Relevant IS specifications of earth electrode for earthing a transformer, a high building |
| 11th | Day 1 | Earthing layout of distribution transformer |
| | Day 2 | Substation earthing layout and earthing materials |
| 12th | Day 1 | Key diagram of 11kV, 33kV: sheet |
| | Day 2 | 66kV, 132 kV sub-stations: sheet |
| 13th | Day 1 | Revision/checking |
| | Day 2 | **3: Schematic Diagram of lighting system of conference room: 2 sheets** |
| 14th | Day 1 | Theatre/sports stadium (indoor and outdoor) and |
| | Day 2 | Circuits using timers using CAD and , Drawing sheets |
| 15th | Day 1 | Revision/checking |
| | Day 2 | Revision/checking |

| **Lesson Plan** | |
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| **Name of Faculty** | Sh Rahul Nehra |

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|---|---|
| **Discipline** | Electrical Engineering |
| **Semester** | 4th |
| **Subject** | Electrical Machine-I |
| **Lesson Plan Duration** | 14 Week (From March 2023 to June 2023) Theory :04, Practical:02 |

| **Week** | **Theory** | | **Practical** | |
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| | **Lecture Day** | **Topic ( Including Assignment/ Test)** | **Practical day** | **Topic** |
| 1st | Day1 | **1:Introduction to Electrical Machines** | Day1 | To measure the angular displacement of rotor of the three phase synchronous machine with respect to the stator on application of DC to the field winding and simultaneously to each phase-winding in sequence |
| | Day 2 | Definition of motor and generator | | |
| | Day 3 | Torque development due to alignment of two fields and the concept of torque angle | | |
| | Day 4 | Electro-magnetically induced emf | | |
| 2nd | Day 1 | Elementary concept of an electrical machine | Day1 | |
| | Day 2 | Comparison of generator and motor | | Speed control of DC shunt motor (i) Armature control method |
| | Day 3 | Generalised theory of electrical machines | | |
| | Day 4 | Revision/Assignment Checking | | |
| 3rd | Day 1 | Class test | Day1 | (ii) Field control method |
| | Day 2 | **2: Introduction to DC Machines** | | |
| | Day 3 | Main constructional features, Types of armature winding | | |
| | Day 4 | Function of the commutator for motoring and generation action | | |
| 4th | Day 1 | Factors determining induced emf | Day1 | Practical Quiz No.1/ Revision and file checking |
| | Day 2 | Factors determining the electromagnetic torque | | |
| | Day 3 | Various types of DC generators | | |
| | Day 4 | Significance of back e.m.f., the relation between back emf and Terminal voltage | | |
| 5th | Day 1 | Armature Reaction | Day1 | Study of DC series motor with starter(to operate the motor on no load ) |
| | Day 2 | Methods to improve commutation | | |
| | Day 3 | Performance and characteristics of different types of DC motors | | |
| | Day 4 | Speed control of dc shunt/series motors | | |
| 6th | Day 1 | Need of starter, three point dc shunt motor starter and | Day1 | Determine efficiency of DC motor by Swinburne's Test at (i) rated capacity, half full load |
| | Day 2 | 4 point starter, Electric Braking | | |
| | Day 3 | Applications of DC motors | | |
| | Day 4 | Faults in dc machines and their retrospective | | |
| 7th | Day 1 | Losses in a DC machine | Day1 | To perform open circuit and short circuit test of transformer for determining: equivalent circuit , the regulation and efficiency |
| | Day 2 | Determination of losses by Swinburne's test | | |
| | Day 3 | Rating and Specifications of DC machines | | |

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| | Day 4 | Revision/Assignment Checking | | |
| 8th | Day 1 | Class test | Day1 | Practical Quiz No.1/ Revision and file checking |
| | Day 2 | **3: Introduction, Single Phase Transformer** | | |
| | Day 3 | Constructional features of a transformer and | | |
| | | parts of transformer | | |
| | Day 4 | Working principle of a transformer | | |
| 9th | Day 1 | EMF equation | Day1 | To find the efficiency and regulation of single phase transformer by actually loading it |
| | Day 2 | Transformer on no-load and its phasor diagram | | |
| | Day 3 | Transformer – neglecting voltage drop in the windings – | | |
| | Day 4 | Ampere turn balance – its phasor diagram | | |
| 10th | Day 1 | Mutual and leakage fluxes, leakage reactance | Day1 | Checking the polarity of the windings of a three phase transformer and connecting the windings in various configurations |
| | Day 2 | Transformer on load, voltage drops and its phasor diagram | | |
| | Day 3 | Equivalent circuit diagram | | |
| | Day 4 | Relation between induced emf and terminal voltage | | |
| 11th | Day 1 | voltage regulation of a transformer-mathematical relation | Day1 | Finding the voltage and current relationships of primary and secondary of a three phase transformer under balanced load in various configuration conditions such as Star-Star, Stardelta. |
| | Day 2 | Losses in a transformer | | |
| | Day 3 | Open circuit and | | |
| | Day 4 | Short circuit test. | | |
| 12th | Day 1 | Calculation of efficiency, condition for maximum efficiency-maintenance of Transformer, scheduled Maintenance | | |
| | Day 2 | Auto transformer construction, working and applications | Day1 | Delta-star Delta – Delta configuring conditions |
| | Day 3 | Different types of transformers including dry type transformer. | | |
| | Day 4 | Rating and Specifications of single phase transformer | | |
| 13th | Day 1 | Revision/Assignment Checking | Day1 | Practical Quiz No.1/ Revision and file checking |
| | Day 2 | **4: Three Phase Transformer** | | |
| | Day 3 | Construction of three phase transformers and accessories of transformers such as Conservator, | | |
| | Day 4 | breather, Buchholtz Relay, Tap Changer (off load and on load) (Brief idea) | | |

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| 14th | Day 1 | Types of three phase transformer i.e. deltadelta, delta-star, star-delta and star-star | Day1 | Viva-voice/Practice of experiment |
| | Day 2 | Star delta connections (relationship between phase and line voltage, phase and line current) | | |
| | Day 3 | Conditions for parallel operation (only conditions are to be studied) | | |
| | Day 4 | On load tap changer | | |
| 15th | Day 1 | Difference between power and distribution transformer | Day1 | Revision and checking |
| | Day 2 | Cooling of transformer | | |
| | Day 3 | Rating and Specifications of three phase transformers | | |
| | Day 4 | Revision/Assignment Checking | | |

| Lesson Plan | | | | |
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| **Name of Faculty** | Ms.Pinki | | | |
| **Discipline** | Electrical Engineering | | | |
| **Semester** | 4th | | | |
| **Subject** | Electrical measuring instruments and instrumentation | | | |
| **Lesson Plan Duration** | 14 Week (From March 2023 to June 2023) Theory : 04, Practical : 02 | | | |
| **Week** | **Theory** | | | **Practical** |
| | **Lecture Day** | **Topic (including Assignment/ Test)** | **Practical Day** | **Topic** |
| 1st | Day 1 | **1: Introduction to Electrical Measuring Instruments**: | Day 1 | Use of analog and digital Multi meter for measurement of voltage, current (A.C/D.C) and resistance |
| | Day 2 | Concept of measurement and instruments | | |
| | Day 3 | Measurements, sources of error. | | |
| | Day 4 | Types of electrical measuring instruments – indicating | | |
| 2nd | Day 1 | integrating and recording type instruments | Day 1 | Measurement of pressure by using LVDT |
| | Day 2 | Essentials of indicating instruments – deflecting, controlling and | | |
| | Day 3 | damping torque and its types | | |
| | Day 4 | Revision / assignment | | |
| 3rd | Day 1 | Class test | Day 1 | Revision and checking |
| | Day 2 | **2: Ammeters and Voltmeters,** difference | | |
| | Day 3 | Construction and working principles of moving Iron-types | | |
| | Day 4 | and moving coil instruments-types | | |
| 4th | Day 1 | Merits and demerits, sources of error | Day 1 | To measure the value of earth resistance using earth tester |
| | Day 2 | and application of these instruments | | |
| | Day 3 | Revision / assignment | | |
| | Day 4 | Class test | | |
| 5th | Day 1 | **3:Wattmeters (Dynamometer Type)** | Day 1 | To measure power, power factor in a single-phase circuit, using wattmeter and power factor meter |
| | Day 2 | Construction, working principle, merits and demerits Digital wattmeter | | |
| | Day 3 | Revision / assignment | | |
| | Day 4 | Class test | | |
| 6th | Day 1 | **4: Energy meter Induction Type** | Day 1 | Revision and checking |
| | Day 2 | Construction, working principle, merits and demerits of single-phase | | |
| | Day 3 | three-phase energy meters | | |
| | Day 4 | Errors and their compensation | | |
| 7th | Day 1 | Simple numerical problems | Day 1 | Measurement of power and power factor of a three-phase |
| | Day 2 | Construction and working principle of maximum demand indicators | | |

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| | Day 3 | Digital energy meter (diagram, construction and application) | | balanced load by two wattmeter method |
| | Day 4 | Revision / assignment | | |
| 8th | Day 1 | **5: Miscellaneous Measuring Instruments** | Day 1 | Measurement of voltage and frequency of a sinusoidal signal using CRO and draw wave shape of signal |
| | Day 2 | Construction, working principle and application of Meggar, | | |
| | Day 3 | Earth tester(analog and digital) | | |
| | Day 4 | Multimeter, Frequency meter (dynamometer | | |

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| | | type) single phase power factor meter (Electrodynamometer type | | |
| 9th | Day 1 | Working principle of synchroscope | Day 1 | Revision and checking |
| | Day 2 | phase sequence indicator | | |
| | Day 3 | tong tester (Clamp-on meter) | | |
| | Day 4 | Instrument Transformers: Construction, working and applications CT, PT | | |
| 10th | Day 1 | Revision / assignment | Day 1 | Measurement of power in a 3 phase circuit using CT, PT and 3-phase wattmeter |
| | Day 2 | Class test | | |
| | Day 3 | **6: Electronic Instruments introduction** | | |
| | Day 4 | Cathode Ray Oscilloscope: Block diagram, working principle of CRO and | | |
| 11th | Day 1 | Its various controls. Applications of CRO. | Day 1 | Use of LCR meter for measuring inductance, capacitance and resistance |
| | Day 2 | Digital multi-meter (only block diagram) and Applications | | |
| | Day 3 | Revision / assignment | | |
| | Day 4 | **7:Study of LCR meters** | | |
| 12th | Day 1 | and their applications | | |
| | Day 2 | Revision / assignment | Day 1 | Revision and checking |
| | Day 3 | **8: Power Measurements in 3-phase circuits by** | | |
| | Day 4 | Two wattmeter method in balanced | | |
| 13th | Day 1 | unbalanced circuits and simple problems | Day 1 | To record all electrical quantities from the meters installed in the institution premises. |
| | Day 2 | Three wattmeter method | | |
| | Day 3 | Revision / assignment | | |
| | Day 4 | **9:Transducers,** Introduction, Types of Transducers (1 phase,3 phase) | | |
| 14th | Day 1 | Basic concept of pressure measurement | Day 1 | Measurement of temperature by using thermister/Thermal Imager |
| | Day 2 | flow measurement | | |
| | Day 3 | level measurement | | |
| | Day 4 | displacement measurement using transducers | | |
| 15th | Day 1 | Revision / assignment | Day 1 | Revision and checking |

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| | Day 2 | **10: Measurement of Temperature** Different types of thermometers, thermocouple | | |
| | Day 3 | resistance temperature detector and their construction, principle and working | | |
| | Day 4 | Thermal Imager Camera (Concept) | | |

## Lesson Plan

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| **Name of Faculty** | Sh.Ashish Kumar Yadav |
| **Discipline** | Electrical Engineering |
| **Semester** | 4th (even- semester) |
| **Subject** | Installation and maintenance of electrical equipment |
| **Lesson Plan Duration** | From March2023 to June 2023 |
| **Work load (Theory + Practical ) Per Week** | (04+00) |
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| Week | Day | Topics |
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| 1st | 1 | **Unit 1 :Tools, Accessories** and instruments required for installation maintenance |
| | 2 | accessories and repair work Knowledge of Indian Electricity rules, safety codes, |
| | 3 | causes prevention of accidents, artificial respiration of an electrocuted person |
| | 4 | workmen's safety devices |
| 2nd | 1 | Class test and revision |
| | 2 | **Unit 2 :Installation**, 2.1 Installation of transmission and Distribution Lines: |
| | 3 | Erection of steel structures, connecting jumpers, tee-off points, joints and dead ends |
| | 4 | crossing of roads, streets, power/telecommunication lines and |
| 3rd | 1 | railway line crossings clearances; earthing of transmission lines and guarding, |
| | 2 | spacing and configuration of conductors: |
| | 3 | Arrangement for suspension and strain insulators, bird guards, anti-climbing devices and danger plates; |
| | 4 | Sizes of conductor, earth wire and guy wires. |
| 4th | 1 | Laying of service lines, earthing, provision of service fuses, |
| | 2 | installation of energy meters |
| | 3 | 2.2 Laying of Underground Cables: |
| | 4 | Inspection, storage, transportation and handling of cables |
| 5th | 1 | cable handling equipment, cable laying depths and clearances from other services |
| | 2 | such as: water, sewerage, gas, heating and other mains, |
| | 3 | and also a series of power and telecommunication cables and coordination with these services |
| | 4 | excavation of trenches, direct cable laying, including laying of cable from the drum, |
| 6th | 1 | laying cable in the trench, taking all measurements and making drawings, |
| | 2 | Back filling of trenches with earth or sand, Laying protective layer of bricks etc. |
| | 3 | Laying of cables into pipes and conduits and within buildings. |
| | 4 | Class test/ revision |
| 7th | 1 | Problem solution |

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| | 2 | 2.3 Elementary idea regarding, inspection and handling of transformers; |
| | 3 | pole mounted substations, plinth mounted substations, grid substation, bus bars |
| | 4 | isolators, voltage and current transformers, lightning arrestors, |
| | 1 | control and relay panels, HT/LT circuit breakers, LT switches, installation of |
| | 2 | Power/distribution transformers, dehydration. Earthing system |
| | 3 | fencing of yard, equipment foundations and trenches etc. |
| 8th | 4 | 2.4 Testing of various electrical equipment such as electrical motor, |
| | 1 | transformers, cables, and generators, motor control centres, medium |
| | 2 | voltage distribution panels, power control center's, motor control center's, |
| | 3 | lighting arrangement, storage, pre-installation checks, connecting and |
| 9th | 4 | starting, pre-commissioning checks, drying out |
| | 1 | Class test/ revision |
| | 2 | Problem solution |
| | 3 | **3 Maintenance** |
| 10th | 4 | 3.1 Types of maintenance, maintenance schedules, procedures |

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| | 1 | 3.2 Maintenance of Transmission and Distribution System |
| | 2 | Authorized persons, danger notice, caution notice, permit to work, |
| | 3 | arranging of shutdowns personally, temporary earthing, cancellation of permit and restoration of supply |
| 11th | 4 | Patrolling and visual inspection of lines - points to be noted during patrolling from ground; |
| | 1 | special inspections and night inspections; |
| | 2 | Location of faults using Meggar, effect of open or loose neutral connections, |
| | 3 | provision of proper fuses on service lines and their effect on system, |
| 12th | 4 | causes of dim and flickering lights |
| 13th | 1 | 3.3 Maintenance of Distribution Transformers |
| | 2 | Transformer maintenance and points to be attended to in respect of various items of equipment |
| | 3 | Checking of insulation resistance, transformer oil level and BDV test of oil, measurement of earth resistance |
| | 4 | 3.4 Maintenance of Grid Substations, Checking and maintenance of busbars, |
| 14th | 1 | Isolating switches, HT/LT circuit breakers, LT switches. Power transformers |
| | 2 | 3.5 Maintenance of Motors, over hauling of motors, preventive maintenance, trouble shooting of electric motors, |
| | 3 | 3.6 Domestic Installation: Introduction;testing of electrical installation of a building, testing of insulation resistance to earth |
| | 4 | testing of insulation and resistance between conductors, |
| | 1 | continuity or open circuit test |
| | 2 | Class test/ revision |
| | 3 | Viva-voice related to subject |
| 15th | 4 | Revision/Review/Test of old HSBTE Papers |

**Lesson plan**