Gyan Ganga Polytechnic Heengakheri (Kurukshetra)

Electrical Engineering Department

Lesson Plan

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| **Name of the Faculty** | | | **MANISH KUMAR** |
| **Discipline** | | | **Electrical Engineering** |
| **Semester** | | | **3rd** |
| **Subject** | | | **Estimating and costing** |
| **Lesson Plan Duration** | | | **From September 2022 to Jan 2023** |
| **Work Load (Theory/Practical) per week /3hours** | | | **(Theory 04 / Practical 02) (Group1+group2)** |
| **Week** | **Day** | **Practical** | |
| **1** | **1** | Introduction to complete syllabus of Estimating & Costing in Electrical Engg. | |
| **2** | Unit-1: Purpose estimating and costing,  Performa for making estimates,  Preparation of materials schedule | |
| **3** | Costing, price list,  Preparation of tender document | |
| **4** | Net price list,  Market survey | |
| **2** | **1** | Overhead charges,  Labour charges, | |
| **2** | Electrical point method and fixed percentage method,  contingency, | |
| **3** | Profit,  purchase system, | |
| **4** | Enquiries,  comparative statements | |
| **3** | **1** | Payment of bills.  Orders for supply | |
| **2** | Tenders – its constituents, finalization,  Specimen tender. | |
| **3** | Unit-2: Types of wiring:  Cleat, batten wiring, | |
| **4** | casing capping and  conduit wiring, | |
| **4** | **1** | Comparison of different wiring systems. | |
| **2** | Design of wiring schemes for particular situation of domestic installation. | |
| **3** | Design of wiring schemes for particular situation Industrial Installation. | |
| **4** | Selection of wires and cables, | |
| **5** | **1** | Wiring accessories used for Electrical Installation | |
| **2** | Use of protective devices i.e. MCB, ELCB etc. | |
| **3** | Use of wire-gauge and tables ( to be prepared/arranged) | |
| **4** | Revision/ queries of unit-1,2 ;  First assignment will be given | |
| **6** | **1** | Assignment –I check | |
| **2** | Tentative 1st sessional test | |
| **3** | Evaluation of sessional marks etc.  Display and analysis of sessional marks | |
| **4** | Unit-3 Estimating &costing:  Domestic installations;  description of various tests to test the wiring installation before commissioning, | |
| **7** | **1** | Standard practice as per IS and IE rules.  Planning of circuits, sub circuits. | |
| **2** | Position of different accessories,  Electrical layout of Domestic Installation | |
| **3** | Preparing estimates including cost as per schedule rate pattern and actual market rate  ( for house of two room set along with layout sketch) | |
| **4** | Industrial installations;  Relevant IE rules and IS standard practices, | |
| **8** | **1** | Planning of installation for single phase motors of different rating.  designing for single phase motors of different ratings | |
| **2** | Estimation of installation for single phase motors of different ratings,  Electrical circuit diagram for Industrial installations , | |
| **3** | Starters for Industrial installations.  Preparation of list of materials for Industrial installations, | |
| **4** | Estimating and costing exercises on workshop with singe-phase motor load | |
| **9** | **1** | Estimating and costing exercises on workshop with 3-phase motor load and the light load (3-phase supply system) | |
| **2** | Service line connections estimate for domestic upto10 KW from pole to energy meter. | |
| **3** | Service line connections estimate for Industrial loads upto 20 KW over-head connection from pole to energy meter. | |
|  | **4** | Service line connections estimate for Industrial loads upto 20 KW underground connections from pole to energy meter.  Second assignment will be given | |
| **10** | **1** | Revision/ queries of unit-3 | |
| **2** | Assignment –II check. | |
| **3** | Tentative 2nd sessional test | |
| **4** | Evaluation of sessional marks etc. | |
| 11  11  **11** | **1** | Display and analysis of sessional marks | |
| **2** | Unit-4 :-Estimating the material required 4(a):  Transmission and distribution lines overhead planning and designing of lines with different fixtures based on unit cost calculations | |
| **3** | Transmission and distribution lines overhead planning and designing of earthing etc. | |
| **4** | Transmission and distribution lines underground planning and designing of lines with different fixtures, based on unit cost calculations | |
| **12** | **1** | Transmission and distribution lines underground planning and designing of lines with earthing etc. | |
| **2** | Substation:  Types of substations,  substation schemes and components | |
| **3** | Estimate of 11/0.4 KV pole mounted substation up to 200 KVA rating, | |
| **4** | Methods of earthing of substations,  Key Diagram of 66 KV/11KV | |
| 1  13 | **1** | Single line diagram, layout sketching of outdoor, indoor 11kV sub-station | |
| **2** | Unit 5 Preparation of Tender Documents | |
| **3** | At least 2-3 exercises,  tender – constituents finalization | |
| **4** | At least 2-3 exercises, specimen tender | |
| 14 | **1** | 3rd assignment will be given  Revision/ queries of unit-4 | |
| **2** | Assignment –III check | |
| **3** | Tentative 3rd sessional test | |
| **4** | Evaluation of sessional marks etc  Display/analysis of 3rd sessional test | |
| 15 | **1** | Remedial will be taken if any shortcomings found  Previous state boards question will be carried out, any other left out topic | |
| **2** | Seminal/group discussion as per evaluation scheme | |
| **3** | Seminal/group discussion as per evaluation scheme | |
| **4** | Seminal/group discussion as per evaluation scheme, Final Sessional test | |

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Electrical Engineering Department

Lesson Plan

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|  | **Name of Faculty** | | | | | **Mr. Manish Kumar** | | |
|  | **Discipline** | | | | | **Electrical Engineering** | | |
|  | **Semester** | | | | | **3rd semester** | | |
|  | **Subject** | | | | | **Non- Conventional Energy Sources** | | |
|  | **Lesson Plan Duration** | | | | | **From September 2022 to Jan 2023** | | |
|  | **Work load (Theory + Practical ) Per Week** | | | | | **(04+00)** | | |
|  |  | | | | |  | | |
| **Week** | | | **Day** | | **Topics** | | |  |
| 1st | | | 1 | | Discussion of Course Objective of NCES subject/ Syllabus | | |  |
| 2 | | Unit :1 Introduction to Basics of Energy | | |  |
| 3 | | Classification of Energy-primary and secondary energy | | |  |
| 4 | | commercial and non-commercial energy | | |  |
| 2nd | | | 1 | | Importance of non-conventional energy sources | | |  |
| 2 | | Present scenario, Future Prospectus | | |  |
| 3 | | Energy Scenario in India, Sector-wise energy consumption (domestic, industrial,  agriculture etc) | | |  |
| 4 | | Revision and problem related to 1st unit/ discussion related to topic | | |  |
| 3rd | | | 1 | | Unit : 2 Introduction to Solar Energy | | |  |
| 2 | | Principle of conversion of solar radiation into heat, photo-voltaic cell | | |  |
| 3 | | Electricity generation | | |  |
| 4 | | Application of Solar Energy like solar water heaters | | |  |
| 4th | | | 1 | | Solar Furnaces | | |  |
| 2 | | Solar Cookers | | |  |
| 3 | | Solar lighting, Solar pumping | | |  |
| 4 | | Class Test of 1st unit | | |  |
| 5th | | | 1 | | Unit: 3 Bio- energy | | |  |
| 2 | | Bio-mass conversion technologies-wet and dry processes | | |  |
| 3 | | Revision and problem related to 2nd Unit/ discussion related to topic | | |  |
| 4 | | Quiz Test | | |  |
| 6th | | | 1 | | Methods for obtaining energy from biomass | | |  |
| 2 | | Power generation by using gasifiers | | |  |
| 3 | | Revision and problem related to 3rd unit | | |  |
| 4 | | Class Test of 2nd unit | | |  |
| 7th | | | 1 | | Unit : 4 Introduction to Wind energy | | |  |
| 2 | | Wind Energy Conversion | | |  |
| 3 | | Windmills | | |  |
| 4 | | Electricity generation from wind- Types of wind mills | | |  |
| 8th | | | 1 | | Local Control | | |  |
| 2 | | Energy storage | | |  |
| 3 | | Revision and problem related to 4th Unit/ discussion related to topic | | |  |
| 4 | | Class Test of 3rd unit, Conduct of 1st Sessional test (tentative) | | |  |
| 9th | | | 1 | | Display of 1st sessional marks and identification of weak students. | | |  |
| 2 | | Unit: 5 Introduction to Geo-thermal and Tidal Energy, Geo-thermal sources | | |  |
| 3 | | Ocean thermal electric conversion | | |  |
|  | | | 4 | | Open and Closed cycles | | |
| 10th | | | 1 | | Hybrid cycles | | |
| 2 | | Prime movers for geo-thermal energy conversion | | |
| 3 | | Steam Generation and electricity generation | | |
| 4 | | Revision and problem related to 5th unit/ discussion related to topic | | |
| 11th | | | 1 | | Unit :- 6 Introduction to MHD | | |
| 2 | | Magneto hydro Dynamic (MHD) | | |
| 3 | | Revision and problem related to 5thunit | | |
| 4 | | Class Test of 5th unit | | |
| 12th | | | 1 | | Unit : 7 Fuel Cells | | |
| 2 | | Design and operating Principles of a fuel cell | | |
| 3 | | Conversion Efficiency | | |
| 4 | | Revision and problem related to 6thunit, Conduct of 2nd Sessional test (tentative) | | |
| 13th | | | 1 | | Display of 2nd sessional marks and identification of weak students. | | |
| 2 | | Work output and e.m.f of fuel cells, Applications | | |
| 3 | | Revision and problem related to 6thunit | | |
| 4 | | Class Test of 6th unit | | |
| 14th | | | 1 | | Unit : 8 Hydro Energy | | |
| 2 | | Mini & micro hydro plants | | |
| 3 | | Revision and problem related to 7th unit/ discussion related to topic | | |
| 4 | | Class Test of 7th unit | | |
| 15th | | | 1 | | Revision and problem related to 8th unit | | |
| 2 | | Discussion of old question paper of HSBTE. | | |
| 3 | | Conduct of 3rd Sessional test (tentative) | | |
| 4 | | Display of 3rd Sessional marks | | |
| 16th | | | 1 | | Identification of weak students | | |
| 2 | | Viva-voice related to subject | | |
| 3 | | Revision/Review/Test of old HSBTE Papers | | |
| 4 | | Revision/Review/Test of old HSBTE Papers | | |

Gyan Ganga Polytechnic Heengakheri (Kurukshetra)

Electrical Engineering Department

Lesson Plan

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| **Name of Faculty** | | | **Er. Kishan Popli** | | |
| **Discipline** | | | **Electrical Engineering** | | |
| **Semester** | | | **3rd** | | |
| **Subject** | | | **Electronics-II** | | |
| **Lesson Plan Duration** | | | **From September 2022 to Jan 2023** | | |
| **Workload (Theory + Practical) Per Week** | | | **[03 + 02] Group 1 & 2** | | |
| **Week** | **Day** | **Theory Topic/ Assignment/ Test** | | **No.** | **Practical** |
| 1st | 1 | Unit:1 Transistor Audio Power Amplifier | | 1 | To study the effect of coupling capacitor on lower cut off frequency and upper cut off frequency by plotting frequency response curve of a two stage RC coupled amplifier |
| 2 | Difference between voltage and power amplifier | |
| 3 | Terms in Power Amplifier, collector efficiency, distortion and dissipation capability | |
| 2nd | 1 | Classification of power amplifier class A, B and C | | 2 |
| 2 | Class A single-ended power amplifier, its working and collector efficiency Impedance matching in a power amplifier using transformer | |
| To measure (a) optimum load (b) output power (c) signal handling capacity of a push-pull amplifier |
| 3 | Heat sinks in power amplifiers, Push-pull amplifier: circuit details working and advantages | |
| 3rd | 1 | Principles of the working of complementary symmetry push-pull amplifier | | 3 | To measure (a) voltage gain (b) input and output impedance for an emitter follower circuit |
| 2 | Revision/Assignment of 1st unit | |
| 3 | Class test of 1st unit | |
| 4th | 1 | Unit-2 Introduction to tuned voltage amplifier | | 4 | Revision and file checking |
| 2 | Series and parallel resonance, Single and double tuned voltage amplifiers | |
| 3 | Frequency response of tuned voltage amplifiers, Applications of tuned voltage amplifiers | |
| 5th | 1 | Revision/Assignment of 2nd unit | | 5 | To measure frequency generation in (a) Hartley (b) R-C Phase Shift oscillator |
| 2 | Class test of 2nd unit | |
| 3 | Unit 3: Feedback in Amplifiers positive and negative feedback and their need | |
| 6th | 1 | Voltage gain of an amplifier with negative feedback A = A/1+ A | | 6 | Revision and file checking |
| 2 | Effect of negative feedback on voltage gain, stability, distortion, band width | |
| 3 | Output and input impedance of an amplifier | |

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| 7th | 1 | Typical feedback circuits | 7 | To observe the differentiated and integrated square wave on a CRO for different values of R-C time constant |
| 2 | Effect of removing the emitter by-pass capacitor on a CE transistor amplifier |
| 3 | Emitter follower and its applications |
| 8th | 1 | Revision/Assignment of 3rd unit |  | Clipping of both portion of sine- |
| 2 | Unit 4: Sinusoidal oscillators amplifier positive |
|  | |  | feedback | 8 | wave using: diode and dc source/ Zener diodes |
| 3 | Difference between an oscillator and an alternator |
| 9th | | 1 | Essentials of an oscillator, Circuit details and working of LC oscillators | 9 | Clamping a sine-wave to: Negative dc voltage Positive dc voltage |
| 2 | Tuned Collector, Hartley |
| 3 | and Colpitt’s oscillators, R-C oscillator circuits |
| 10th | | 1 | phase shift and Wein bridge oscillator circuits | 10 | Practical Quiz No.3/ Revision and file checking |
| 2 | Introduction to piezoelectric crystal and crystal oscillator circuit |
| 3 | Revision/Assignment of 4th unit |
| 11th | | 1 | Wave-Shaping and Switching Circuits | 11 | To generate square-wave using an astable multivibrator and to observe the wave form on a CRO |
| 2 | Concept of Wave-shaping circuits |
| 3 | R-C differentiating and integrating circuits |
| 12th | | 1 | Diode clipping circuits, Diode clamping circuits | 12 | To observe triggering and working of a bistable multivibrator circuit and observe its output wave form on a CRO |
| 2 | Applications of wave-shaping circuits, Transistor as a switch |
| 3 | Collector coupled astable, monostable, Bistable multivibrator circuits |
| 13th | | 1 | Working and applications of transistor inverter circuit using power transistors | 13 | Practical Quiz No.3/ Revision and file checking |
| 2 | Revision/Assignment of 5th unit |
| 3 | Unit6: Working Principles of different types of power supplies viz. CVTs |
| 14 | | 1 | IC voltage regulators(78xx,79xx) | 14 | Op-Amp (IC 741) as inverting and non-inverting amplifier, adder Comparator, integrator and differ  -entiator verify using p-spice |
| 2 | Revision/Assignment of 6th unit |
| 3 | Unit7: Operational Amplifier, differential amplifier |
| 15th | | 1 | Emitter coupled differential amplifier Offset even voltages and currents | 15 | To study the pin configuration and working of IC 555 and its use as mono stable and astable multi vibrator |
| 2 | Integrator and differentiator, Summer, Subtractor |
| 3 | Familiarization with specifications and pin configuration of IC 741 |
| 16th | | 1 | Block diagram and operation of 555 IC timer | 16 | Internal Practical/viva-voice evaluation |
| 2,3 | HSBTE old paper solution |

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Electrical Engineering Department

Lesson plan

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|  | **Name of Faculty** | | | **Er. Krishan Popli** | |
|  | **Discipline** | | | **Electrical Engineering** | |
|  | **Semester** | | | **3rd semester** | |
|  | **Subject** | | | **Electrical and Electronics Engineering Materials** | |
|  | **Lesson Plan Duration** | | | **From September 2022 to Jan 2023** | |
|  | **Work load (Theory + Practical ) Per Week** | | | **(04+00)** | |
|  |  | | |  | |
| **Week** | | **Day** | **Topics** | |  |
| 1st | | 1 | Introduction to Classification of materials | |  |
| 2 | Classification of Conducting ,semi conducting and insulating materials based on atomic  structure | |  |
| 3 | Classification based on energy bands | |  |
| 4 | Revision and Class test of 1st unit | |  |
| 2nd | | 1 | Unit:2  Introduction to Conducting Materials Resistance and factors affecting it  Such as alloying and temperature | |  |
| 2 | Classification of conducting material as low resistivity and high resistivity materials | |  |
| 3 | low resistance materials Copper: General properties as conductor resistivity,  temperature coefficient and density | |  |
| 4 | Mechanical properties of hard-drawn and annealed copper corrosion, contact  resistance | |  |
| 3rd | | 1 | Application of copper in the field of electrical engineering. | |  |
| 2 | Aluminium: General properties as resistivity, temperature coefficient, density | |  |
| 3 | Mechanical properties of hard and annealed aluminium, solder ability, contact  resistance | |  |
| 4 | Applications in the field of electrical engineering. | |  |
| 4th | | 1 | Steel: Mechanical properties of steel | |  |
| 2 | Applications in the field of electrical engineering. | |  |
| 3 | Introduction to bundle conductors and its applications | |  |
| 4 | Low resistivity copper alloys Brass, Bronze and their applications | |  |
| 5th | | 1 | Applications of special metals e.g. Silver, Gold, Platinum etc | |  |
| 2 | High resistivity materials and their applications manganin, constantan, | |  |
| 3 | Nichrome, mercury, platinum, carbon and tungsten | |  |
| 4 | Superconductors and their applications | |  |
| 6th | | 1 | Revision and problem related to 2nd unit | |  |
| 2 | Class Test of 2nd unit | |  |
| 3 | Review of Semi-conducting Materials, Semi-conductors and their properties | |  |
| 4 | Materials used for electronic components like resistors, capacitors, diodes, transistors  and inductors etc | |  |
| 7th | | 1 | Revision and problem related to 3rd unit | |  |
| 2 | Class Test of 3rd unit | |  |
| 3 | Insulating materials; General Properties | |  |
| 4 | Electrical Properties :Resistivity, surface resistance, dielectric loss, dielectric strength | |  |
| 8th | | 1 | Physical Properties Hygroscopicity, tensile and compressive strength, abrasive  resistance, brittleness | |  |
| 2 | Thermal Properties: Heat resistance, classification according to permissible  temperature rise | |  |

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|  | 3 | Chemical Properties: Solubility, chemical resistance, weather ability |
| 4 | Mechanical properties, mechanical structure, tensile structure |
| 9th | 1 | Revision and problem related to 4thunit,Ist Sessional Test |
| 2 | Class Test of 4th unit |
| 3 | Introduction to Insulating Materials and their applications |
| 4 | Plastics Definition and classification |
| 10th | 1 | Thermosetting materials: Bakelite, amino resins, epoxy resins their important  properties and applications |
| 2 | Thermo-plastic materials: PVC, Polyethelene, silicones, their important properties and  applications |
| 3 | Natural insulating materials, properties and their applications |
| 4 | Mica and Mica products, Asbestos and asbestos products, Ceramic materials |
| 11th | 1 | Glass and glass products Cotton, silk, jute, paper, Rubber, Bitumen |
| 2 | Mineral and insulating oil for transformer, insulating varnish for coating and  impregnation |
| 3 | Gaseous materials; Air, Hydrogen, Nitrogen, SF their properties and applications |
| 4 | Revision and problem related to 5thunit |
| 12th | 1 | Class Test of 5th unit |
| 2 | Magnetic Materials: Introduction, Ferromagnetic materials, permeability |
| 3 | B-H curve, magnetic saturation, hysteresis loop including coercive force and residual  magnetism |
| 4 | Concept of eddy current and hysteresis loss, Curie temperature, magnetostriction  Effect. |
| 13th | 1 | Soft Magnetic Materials: Alloyed steels with silicon: High silicon alloy steel for  transformers |
| 2 | low silicon alloy steel for electric rotating machines |
| 3 | Cold rolled grain oriented steels for transformer, Non-oriented steels for rotating  machine, Nickel-iron alloys, Soft Ferrites |
| 4 | Hard magnetic materials Tungsten steel, chrome steel , hard ferrites cobalt and  Steel applications.2nd Sessional test. |
| 14th | 1 | Revision and problem related to 6thunit |
| 2 | Class Test of 6th unit |
| 3 | Special Materials Thermocouple, bimetals |
| 4 | leads soldering and fuses material and their applications |
| 15th | 1 | Revision and problem related to 7thunit |
| 2 | Introduction of various engineering materials necessary for fabrication of electrical  machines |
| 3 | such as motors, generators, transformers etc. |
| 4 | Revision and problem related to 8thunit,Final sessional Test |
| 16th | 1 | Class Test of 8th unit |
| 2 | Viva-voice related to subject |
| 3 | Revision/Review/Test of old HSBTE Papers |
| 4 | Revision/Review/Test of old HSBTE Papers |

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Electrical Engineering Department

Lesson Plan

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| **Name of the Faculty** | | | **MANISH KUMAR** |
| **Discipline** | | | **Electrical Engineering** |
| **Semester** | | | **3rd** |
| **Subject** | | | **EEDD-I** |
| **Lesson Plan Duration** | | | **From September 2022 to Jan 2023** |
| **Work Load (Theory/Practical) per week /3hours** | | | **(Theory 00 / Practical 06) (Group1+group2)** |
| **Week** | **Day** | **Practical** | |
| **1st** | **1** | Unit 1 : Introduction Symbols and Signs Conventions | |
| **2** | Drawing sheet1: Various Electrical Symbols used in Domestic and Industrial Installation  and Power System | |
| **2nd** | **1** | Unit2: Wiring diagram introduction , Drawing sheet2 :Wiring Diagram of light | |
| **2** | Drawing sheet: Wiring Diagram of fan | |
| **3rd** | **1** | Drawing sheet: Wiring Diagram bell and alarm circuits | |
| **2** | Drawing sheet: Wiring Diagram Staircase | |
| **4th** | **1** | Drawing sheet: Wiring Diagram godown wiring | |
| **2** | Checking and correction in Drawing sheet | |
| **5th** | **1** | Unit 3: Introduction Panels/Distribution Boards | |
| **2** | Two Drawing sheet : panels/Distribution board using MCB and ELCB and change over switches for domestic installation | |
| **6th** | **1** | Drawing sheet: industrial and commercial installation | |
| **2** | Checking and correction in Drawing sheet | |
| **7th** | **1** | Unit4: Introduction to orthographic projections of Simple Electrical Parts | |
| **2** | Drawing sheet of Bus bar post/ Kit Kat | |
| **8th** | **1** | Drawing sheet of Pin type and shackle type insulator (Pin Type 11kV/66kV) | |
| **2** | Checking and correction in Drawing sheet ,Ist Sessional Test | |
| **9th** | **1** | Drawing sheet of Bobbins of a small transformer / choke | |
| **2** | Drawing sheet of Stay insulators/Suspension type insulators | |
| **10th** | **1** | Checking and correction in Drawing sheet | |
| **2** | Drawing sheet of Rotor of a squirrel cage induction motor | |
| **11th** | **1** | Drawing sheet of Motor body (induction motor) as per IS Specifications (using outside dimensions) | |
| **2** | Checking and correction in Drawing sheet | |
| **12th** | **1** | Drawing sheet of Slip rings of 3-phase induction Motor | |

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|  | **2** | Drawing sheet of Stator of 3 phase Induction motor (Sectional View) ,Second Sessional test |
| **13th** | **1** | Checking and correction in Drawing sheet |
| **2** | Unit 5: Introduction to AutoCAD Drawing sheet1 Prepare wiring diagram and block diagrams for circuits/systems using any Engineering Graphic package (preferably CAD) |
| **14th** | **1** | Checking and correction in Drawing sheet |
| **2** | Checking and correction in Drawing sheet |
| **15th** | **1** | Revision/checking |
| **2** | Revision/checking ,3rd Sessional test |
| **16th** | **1** | Quiz/Checking and correction in Drawing sheet |
| **2** | Viva-voice and Internal Practical |