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| Lesson Plan  |  |
| **Name of the faculty :** | POONAM SHARMA |
| **Discipline :** | Electrical |
| **Semester :** | 5th |
| **Subject :** |  | Utilization of electrical engineeringv |
| **Lesson Plan Duration :** | 15 weeks (from sept 2022 to dec 2022) |
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| **Work load (Lecture/Practical) per week (55 minutes) : Lectures-05**  |
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| **Week** | **Theory** |
| **Lecture day** | **Topic (Including assignment/test)** |
| 1st | Ist | Introduction |
| 2nd | Advantages of electrical heating |
| 3rd | Resistance heating – direct and indirect resistance heating |
| 4th  | electric ovens, their temperature range, properties of resistance heating elements, domestic water heaters |
| 5th | other heating appliances, thermostat control circuit |
| 2nd | Ist | Induction heating; principle of core type and coreless induction furnace |
| 2nd | construction and applications of core type and coreless induction furnace |
| 3rd | Electric arc heating; direct and indirect arc heating, |
| 4th  | working and applications of arc furnace |
| 5th | Dielectric heating, applications in various industrial fields |
| 3rd | Ist | Infra-red heating and its applications (construction and working of two appliances |
| 2nd | Microwave heating and its applications (construction and working of two appliances |
| 3rd | Solar Heating Calculation of resistance heating elements (simple problems) |
| 4th  | Calculation of resistance heating elements (simple problems) |
| 5th | revision & Copy check |
| 4th | Ist | revision & Copy check |
| 2nd | Advantages of electric welding |
| 3rd | Welding method 3.2.1 Principles of resistance welding, types – spot, projection, seam and butt welding, |
| 4th  | Welding method 3.2.1 Principles of resistance welding, types – spot, projection, seam and butt welding, |
| 5th | welding equipments |
| 5th | Ist | Principle of arc production, electric arc welding, characteristics of arc; |
| 2nd | Carbon arc,metal arc, hydrogen arc welding method and their applications |
| 3rd | Power supply requirement. Advantages of using coated electrodes |
| 4th  | comparison between AC and DC arc welding, welding control circuits, welding of aluminum and copper |
| 5th | revision & Copy check |
| 6th | Ist | revision & Copy check |
| 2nd | Electrolytic Processes: (10 hrs) 4.1 Need of electro-deposition |
| 3rd |  Laws of electrolysis, |
| 4th  | process of electro-deposition - clearing, operation, deposition of metals, polishing and buffing |
| 5th | Equipment and accessories for electroplating |
| 7th | Ist | Factors affecting electro-deposition |
| 2nd | Principle of galvanizing and its applications |
| 3rd | Principles of anodizing and its applications |
| 4th  | Electroplating of non-conducting materials 4.8  |
| 5th | Manufacture of chemicals by electrolytic process Power supplies for electroplating |
| 8th | Ist | revision & Copy check |
| 2nd | revision & Copy check |
| 3rd | . introduction Principle of air conditioning, vapour pressure, |
| 4th  | Electrical Circuits used in Refrigeration, Air Conditioning and Water Coolers, |
| 5th | refrigeration cycle,  |
| 9th | Ist | eco-friendly refrigerants |
| 2nd | Description of Electrical circuit used in Refrigerator |
| 3rd | Description of Electrical circuit used in Air-conditioner |
| 4th  | Description of Electrical circuit used in Water cooler |
| 5th | revision & Copy check |
| 10th | Ist | Advantages of electric drives  |
| 2nd | Characteristics of different mechanical loads  |
| 3rd | Types of motors used as electric drive |
| 4th  |  Electric braking Plugging  |
| 5th | Rheostatic braking  |
| 11th | Ist |  Regenerative braking |
| 2nd | General idea about the methods of power transfer by direct coupling by using devices like belt drive, gears, chain drives etc.  |
| 3rd | Examples of selection of motors for different types of domestic loads |
| 4th  | Selection of drive for applications such as general workshop, textile mill, paper mill, steel mill, printing press, crane and lift etc.  |
| 5th | Application of flywheel.  |
| 12th | Ist |  Specifications of commonly used motors e.g. squirrel cage motors, |
| 2nd |  Specifications of commonly used motors slip ring induction motors,  |
| 3rd |  Specifications of commonly used motors AC series motors, |
| 4th  |  Specifications of commonly used motors Fractional kilo Watt(FKW) motors |
| 5th | Specifications of commonly used motors Fractional kilo Watt(FKW) motors |
| 13th | Ist | Selection of motors for Domestic Appliances  |
| 2nd | revision & Copy check |
| 3rd | Electric Traction: (10 hrs)  |
| 4th  |  Advantages of electric traction over other types of traction. 7.2 Different systems of electric traction, DC and AC systems, diesel electric system |
| 5th | Types of services – urban, sub-urban, and main line and their speed-time curves  |
| 14th | Ist | Different accessories for track electrification; such as overhead catenary wire, conductor rail system, current collector-pentagraph |
| 2nd | Factors affecting scheduled speed 7 |
| 3rd | Electrical block diagram of an electric locomotive with description of various equipment and accessories used.  |
| 4th  | Types of motors used for electric traction  |
| 5th | Power supply arrangements  |
| 15th | Ist | Starting and braking of electric locomotives  |
| 2nd |  Introduction to EMU and metro railways  |
| 3rd | Train Lighting Scheme Note: Students should be taken for visits to nearest electrified railway track and railway station to study the electric traction system. |
| 4th  | revision & Copy check |
| 5th | revision & Copy check |