**MAHAMAYA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCE,**

**NUAPADA**

**DEPARTMENT OF ELECTRICAL ENGINEERING**

|  |  |  |
| --- | --- | --- |
| **Discipline: Electrical Engineering**  | **Semester: 5th Semester**  |  **Name of the Teaching Faculty:** **ER. K.V. Reddy, Lect. Electrical Engg**   |
| **Subject:** **Utilization of** **Electrical Energy and Traction(UEET)**  | **No. of** **Days/week** **Class**  **Allotted:60**  |  **Semester from date: 15/09/2022 to date: 22 /12/2022** **No of weeks: 14**  |
| **Week**  | **Class Day**  | **Theory Topics**  |
|    1st  | 1st  | ELECTROLYTIC PROCESS: Definition and Basic principle of Electro Deposition.  |
| 2nd  | Important terms regarding electrolysis.  |
| 3rd  | Faradays Laws of Electrolysis.  |
| 4th  | Definitions of current efficiency, Energy efficiency. Principle of Electro Deposition.  |
|      2nd  | 1st   | Factors affecting the amount of Electro Deposition.  |
| 2nd  | Factors governing the electro deposition.  |
| 3rd   | State simple example of extraction of metals.  |
| 4th  | Application of Electrolysis.  |
|    3rd  | 1st  | ELECTRICAL HEATING: Advantages of electrical heating.  Mode of heat transfer and Stephen’s Law.  |
| 2nd  | Principle of Resistance heating. (Direct resistance and indirect resistance heating.)  |
| 3rd  | Discuss working principle of direct arc furnace and indirect arc furnace.  |
| 4th  | Working principle of direct core type, vertical core type and indirect core type Induction furnace.  |
|     4th  | 1st  | Principle of coreless induction furnace and skin effect.  |
| 2nd  | Principle of dielectric heating and its application.  |
| 3rd  | Principle of Microwave heating and its application.  |
| 4th  | PRINCIPLES OF ARC WELDING: Explain principle of arc welding.  |
|    5th  | 1st  | Discuss D. C. & A. C. Arc phenomena.  |
| 2nd  | D.C. & A. C. arc welding plants of single and multioperation type  |
| 3rd  | Types of arc welding.  |
| 4th  | Explain principles of resistance welding.  |
|    6th  | 1st  | Descriptive study of different resistance welding methods.  |
| 2nd  | ILLUMINATION: Nature of Radiation and its spectrum.  |
| 3rd  | Terms used in Illuminations. [Lumen, Luminous intensity, Intensity of illumination, MHCP, MSCP, MHSCP, Solid angle, Brightness, Luminous efficiency.]  |
| 4th  | Explain the inverse square law and the cosine law.  |

|  |  |  |
| --- | --- | --- |
|     7th  |  1st  | Explain polar curves.  Describe light distribution and control. Explain related definitions like maintenance factor and depreciation factors.  |
| 2nd  | Design simple lighting schemes and depreciation factor.  |
|  3rd  |  Constructional feature and working of Filament lamps  |
|  4th  | Effect of variation of voltage on working of filament lamps.   |
|     8th  | 1st  | Explain Discharge lamps.  |
| 2nd  | State Basic idea about excitation in gas discharge lamps.  |
| 3rd  | State constructional factures and operation of Fluorescent lamp. (PL and PLL Lamps)  |
| 4th  | Sodium vapor lamps.  High pressure mercury vapor lamps.  |
|     9th  | 1st  | Neon sign lamps.  High lumen output & low consumption fluorescent lamps.  |
| 2nd  | INDUSTRIAL DRIVES: State group and individual drive.  |
| 3rd  | Method of choice of electric drives.  |
| 4th  | Explain starting and running characteristics of DC and AC motor.  |
|    10th  | 1st  | State Application of: DC motor  |
| 2nd  | State Application of 3-phase induction motor.  |
| 3rd  | State Application of 3 phase synchronous motors.  |
| 4th  | State Application of Single phase induction, series motor, universal motor and repulsion motor.  |
|     11th  | 1st  | ELECTRIC TRACTION: Explain system of traction.  |
| 2nd  | System of Track electrification.  |
| 3rd  | Running Characteristics of DC and AC traction motor.  |
| 4th  | Tapped field control. Rheostatic control.  |
|    12th  | 1st  | Series parallel control. Multi-unit control.  |
| 2nd  | Metadyne control.  |
| 3rd  | Regenerative Braking.  |
| 4th  | Braking with 1-phase series motor.  |
|     13th  | 1st  | Magnetic Braking.  |
| 2nd  | Revision of Chapter-1   |
|   3rd  | Revision of Chapter-2  |
| 4th  |  Revision of Chapter-3   |
|    14th  | 1st  | Revision of Chapter-4  |
| 2nd  | Revision of Chapter-5  |
| 3rd  | Revision of Chapter-6  |
| 4th  | Discussion of probable questions and answers-1  |