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

**NUAPADA**

**DEPARTMENT OF ELECTRICAL ENGINEERING**

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| **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. |

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| 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 |