Discipline: EE	Semester: 5th Sem.	Name of the Teaching Faculty: RADHA KRUSHNA MALLICK
Subject: Utilization of Electrical Energy and Traction	No. of Days/per week class allotted: 04	Semester From Date: sept 2022 to Dec2022 No. of Weeks: 15
Week	Class/ Day	Theory Topics
1st	01	Definition and Basic principle of Electro Deposition.
	02	Important terms regarding electrolysis.
	03	Faradays Laws of Electrolysis.
	04	Definitions of current efficiency, Energy efficiency, Principle of Electro Deposition..
2nd	01	Factors affecting the amount of Electro Deposition.
	02	Factors governing the electro deposition.
	03	State simple example of extraction of metals.
	04	Application of Electrolysis.
3rd	01	Advantages of electrical heating, Principle of Induction heating.
	02	Explain mode of heat transfer and Stephen's Law.
	03	Discuss principle of Resistance heating: Direct Resistance heating, Indirect Resistance heating.
	04	Explain working principle of direct arc furnace and indirect arc furnace.
4th	01	Principle of Induction heat, Working principle of direct core type, vertical core type and indirect core type Induction furnace.
	02	Principle of coreless induction furnace and skin effect.
	03	Principle of dielectric heating and its application.
	04	Principle of Microwave heating and its application.
5th	01	Explain principle of arc welding.
	02	Discuss D. C. arc phenomena.
	03	Discuss A. C. arc phenomena.
	04	D.C. arc welding plants of single and multi-operation type.
6th	01	A. C. arc welding plants of single and multi-operation type.
	02	Types of arc welding.
	03	Explain principles of resistance welding.
	04	Descriptive study of different resistance welding methods.
7th	01	Nature of Radiation and its spectrum.
	02	Terms used in Illuminations: Luminous intensity, Lume, Intensity of illumination, MHCP, MSCP.
	03	Terms used in Illuminations: MHSCP, Brightness, Solid angle, Luminous efficiency.
	04	Explain the inverse square law and the cosine law.
8th	01	Explain polar curves, Describe light distribution and control.
	02	Design simple lighting schemes and depreciation factor.
	03	Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps.
	04	Explain Discharge lamps, State Basic idea about excitation in gas discharge lamps.
9th	01	State constructional factures and operation of: Fluorescent lamp.

		(PL and PLL Lamps)
	02	Sodium vapor lamps, High pressure mercury vapour lamps.
	03	Neon sign lamps, High lumen output & low consumption fluorescent lamps
	04	State group and individual drive.
10th	01	Method of choice of electric drives.
	02	Explain starting and running characteristics of DC motor.
	03	Explain starting and running characteristics of AC motor.
	04	State Application of : DC motor
11th	01	State Application of : phase induction motor
	02	State Application of : phase synchronous motors.
	03	State Application of : Single phase induction, series motor.
	04	State Application of : universal motor and repulsion motor.
12th	01	Explain system of traction.
	02	System of Track electrification.
	03	System of Track electrification.
	04	Running Characteristics of DC traction motor.
13th	01	Running Characteristics of AC traction motor.
	02	Explain control of motor: Tapped field control
	03	Explain control of motor: Rheostatic control
	04	Explain control of motor: Series parallel control
14th	01	Explain control of motor: Metadyne control
	02	Explain control of motor: Metadyne control
	03	Explain Braking of the following types: Regenerative Braking.
	04	Explain Braking of the following types: Braking with 1-phase series motor.
15th	01	Explain Braking of the following types: Braking with 1-phase series motor.
	02	Explain Braking of the following types: Magnetic Braking
	03	Explain Braking of the following types: Magnetic Braking
	04	Revision