

Discipline :Electrical Engineering	Semester:-5th Sem	Name of the teaching faculty:- MANMOHAN PANDA
Subject:-Utilization of Electrical Energy & Traction	No. of Days/week class Allotted :-4	No. of weeks:-15 Session - 2024-2025 (Winter)
No. of week	No. of class	Topic to be Taught
1st	1st	ELECTROLYTIC PROCESS Definition and Basic principle of Electro Deposition
	2nd	Important terms regarding electrolysis Faradays Laws of Electrolysis
	3rd	Definitions of current efficiency, Energy efficiency. Principle of Electro Deposition
	4th	Factors affecting the amount of Electro Deposition
2nd	1st	Factors governing the electro deposition
	2nd	State simple example of extraction of metals
	3rd	State simple example of extraction of metals
	4th	Application of Electrolysis
3rd	1st	ELECTRICAL HEATING Advantages of electrical heating
	2nd	Mode of heat transfer and Stephen's Law
	3rd	Principle of Resistance heating. (Direct resistance and indirect resistance heating.)
	4th	Discuss working principle of direct arc furnace and indirect arc furnace
4th	1st	Principle of Induction heating Working principle of direct core type, vertical core type and indirect coretype Induction furnace
	2nd	Principle of coreless induction furnace and skin effect
	3rd	Principle of dielectric heating and its application
	4th	Principle of Microwave heating and its application
	1st	PRINCIPLES OF ARC WELDING Explain principle of arc welding
	2nd	Discuss D. C. & A. C. Arc phenomena

5th	3 rd	D.C. & A. C. arc welding plants of single and multi-operation type
	4 th	Types of arc welding
6th	1 st	Types of arc welding
	2 nd	Explain principles of resistance welding
	3 rd	Descriptive study of different resistance welding methods
	4 th	Descriptive study of different resistance welding methods
7th	1 st	ILLUMINATION Nature of Radiation and its spectrum
	2 nd	Terms used in Illuminations. [Lumen, Luminous intensity, Intensity of illumination, MHCP, MSCP, MHSCP, Solid angle, Brightness, Luminous efficiency.]
	3 rd	Explain the inverse square law and the cosine law Explain polar curves
	4 th	Describe light distribution and control Explain related definitions like maintenance factor and depreciation factors
8th	1 st	Design simple lighting schemes and depreciation factor
	2 nd	Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps
	3 rd	Explain Discharge lamps. State Basic-idea about excitation in gas discharge lamps
	4 th	State constructional features and operation of Fluorescent lamp. (PL and PLLamps)
9th	1 st	State constructional features and operation of Sodium vapour lamps
	2 nd	State constructional features and operation of High pressure mercury vapor lamps
	3 rd	State constructional features and operation of Neon sign lamps
	4 th	State constructional features and operation of High lumen output & low consumption fluorescent lamps
	1 st	INDUSTRIAL DRIVES State group and individual drive
	2 nd	Method of choice of electric drives
		Explain starting and running characteristics of

10th	3 rd	DC and AC motor
	4 th	Explain starting and running characteristics of DC and AC motor
11th	1 st	State Application of DC motors
	2 nd	State Application of 3-phase induction motors
	3 rd	State Application of 3 phase synchronous motors
	4 th	State Application of Single phase induction motors
12th	1 st	State Application of Series motors,
	2 nd	State Application of universal motors and repulsion motors
	3 rd	ELECTRIC TRACTION Explain system of traction
	4 th	System of Track electrification
13 th	1 st	Running Characteristics of DC and AC traction motor
	2 nd	Running Characteristics of DC and AC traction motor
	3 rd	Running Characteristics of DC and AC traction motor
	4 th	Explain control of motor
14 th	1 st	Tapped field control
	2 nd	Rheostatic control
	3 rd	Series parallel control
	4 th	Multi-unit control:
15 th	1 st	Metadyne control
	2 nd	Explain Braking of the following types Regenerative Braking
	3 rd	Braking with 1-phase series motor
	4 th	Magnetic Braking.

Prepared By
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