

Discipline: Electrical Engineering	SESSION - Winter	Name of the Teaching Faculty: Shri Deepak Patra, Lecturer(S-II), Electrical Engg
Subject: Utilization of Electrical Energy and Traction(UEET)	No. of Days/week Class Allotted:60	SEMESTER-5TH
Class no	Class Date	Theory Topics
1	01	ELECTROLYTIC PROCESS: Definition and Basic principle of Electro Deposition.
2		Important terms regarding electrolysis.
3		Faradays Laws of Electrolysis.
4		Definitions of current efficiency, Energy efficiency. Principle of Electro Deposition.
5	02	Factors affecting the amount of Electro Deposition.
6		Factors governing the electro deposition.
7		State simple example of extraction of metals.
8		Application of Electrolysis.
9	03	ELECTRICAL HEATING: Advantages of electrical heating. Mode of heat transfer and Stephen's Law.
10		Principle of Resistance heating. (Direct resistance and indirect resistance heating.)
11		Discuss working principle of direct arc furnace and indirect arc furnace.
12		Working principle of direct core type, vertical core type and indirect core type Induction furnace.
13	04	Principle of coreless induction furnace and skin effect.
14		Principle of dielectric heating and its application.
15		Principle of Microwave heating and its application.
16		PRINCIPLES OF ARC WELDING: Explain principle of arc welding.
17	05	Discuss D. C. & A. C. Arc phenomena.
18		D.C. & A. C. arc welding plants of single and multi-operation type
19		Types of arc welding.
20		Explain principles of resistance welding.
21	06	Descriptive study of different resistance welding methods.
22		ILLUMINATION: Nature of Radiation and its spectrum.
23		Terms used in Illuminations. [Lumen, Luminous intensity, Intensity of illumination, MHCP, MSCP, MHSCP, Solid angle, Brightness, Luminous efficiency.]
24		Explain the inverse square law and the cosine law.

25	07	Explain polar curves. Describe light distribution and control. Explain related definitions like maintenance factor and depreciation factors.
26		Design simple lighting schemes and depreciation factor.
27		Constructional feature and working of Filament lamps
28		Effect of variation of voltage on working of filament lamps.
29	08	Explain Discharge lamps.
30		State Basic idea about excitation in gas discharge lamps.
31		State constructional features and operation of Fluorescent lamp. (PL and PLL Lamps)
32		Sodium vapor lamps. High pressure mercury vapor lamps.
33	09	Neon sign lamps. High lumen output & low consumption fluorescent lamps.
34		INDUSTRIAL DRIVES: State group and individual drive.
35		Method of choice of electric drives.
36		Explain starting and running characteristics of DC and AC motor.
37	10	State Application of: DC motor
38		State Application of 3-phase induction motor.
39		State Application of 3 phase synchronous motors.
40		State Application of Single phase induction, series motor, universal motor and repulsion motor.
41	11	ELECTRIC TRACTION: Explain system of traction.
42		System of Track electrification.
43		Running Characteristics of DC and AC traction motor.
44		Tapped field control.
45	12	Rheostatic control.
46		Series parallel control.
47		Multi-unit control.
48		Metadyne control.
49	13	Regenerative Braking.
50		Braking with 1-phase series motor.
51		Magnetic Braking.
52		Revision of Chapter-1

53	14	Revision of Chapter-2
54		Revision of Chapter-3
55		Revision of Chapter-4
56		Revision of Chapter-5
57	15	Revision of Chapter-6
58		Discussion of probable questions and answers-1
59		Discussion of probable questions and answers-2
60		Discussion of probable questions and answers-3