

Gandhi Polytechnic, Golanthara

Dept. of Electrical Engineering

LESSON PLAN

Subject:		UTILISATION OF ELECTRICAL ENERGY AND TRACTION	
Discipline: Electrical Engineering		Name of the Faculty: Dr. B.R. Das	
Course Code:	TH-4	Semester:	5 TH
Total Periods:	60	Examination:	2022(Winter)
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	100	End Semester Examination:	80
No's of Week	Periods in week	Theory Topics	
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.	
	4th	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.	
	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 core type 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	
5th	1st	PRINCIPLES OF ARC WELDING: Explain principle of arc welding.	
	2nd	Discuss D. C. & A. C. Arc phenomena.	
	3rd	D.C. & A. C. arc welding plants of single and multi-operation type.	
	4th	Types of arc welding.	
6th	1st	Continue with arc welding.	
	2nd	Explain principles of resistance welding.	
	3rd	Descriptive study of different resistance welding methods.	
	4th	Descriptive study of different resistance welding methods.	
7th	1st	ILLUMINATION: Nature of Radiation and its spectrum.	
	2nd	Terms used in Illuminations. [Lumen, Luminous intensity, Intensity of illumination, MHCP, MSCP, MHSCP, Solid angle, Brightness, Luminousefficiency.]	
	3rd	Explain the inverse square law and the cosine law.	
	4th	Explain polar curves. Describe light distribution and control. Explain related definitions like maintenance factor and depreciation factors.	
8th	1st	Design simple lighting schemes and depreciation factor.	
	2nd	Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps.	
	3rd	Explain Discharge lamps.	
	4th	State Basic idea about excitation in gas discharge lamps.	

9th	1st	State constructional factures and operation of Fluorescent lamp. (PL andPLL Lamps)
	2nd	Sodium vapor lamps
	3rd	High pressure mercury vapor lamps.
	4th	Neon sign lamps. High lumen output & low consumption fluorescent lamps
10th	1st	INDUSTRIAL DRIVES:State group and individual drive.
	2nd	Method of choice of electric drives.
	3rd	Explain starting and running characteristics of DC motor.
	4th	Explain starting and running characteristics of AC motor.
11th	1st	State Application of:DC motor.
	2nd	3-phase induction motor.
	3rd	3 phase synchronous motors.
	4th	Single phase induction
12th	1st	Series motor
	2nd	Universal motor and repulsion motor.
	3rd	ELECTRIC TRACTION: Explain system of traction.
	4th	Explain system of traction.
13th	1st	System of Track electrification.
	2nd	System of Track electrification.
	3rd	Running Characteristics of DC traction motor
	4th	Running Characteristics of AC traction motor
14th	1st	Explain control of Motor:Tapped field control.
	2nd	Rheostatic control.
	3rd	Series parallel control.
	4th	Multi-unit control.
15th	1st	Metadyne control.
	2nd	Explain Braking of the following types:Regenerative Braking.
	3rd	Braking with 1-phase series motor.
	4th	Magnetic Braking.