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DEPARTMENT OF ELECTRICAL ENGINEERING Govt. Polytechnic, Balasore

LESSON PLAN FOR ACADEMIC SESSION - 2024-25 UTILIZATION OF ELECTRICAL ENERGY & TRACTION

Course Code : Th.4	Semester : 5th
Total Periods : 60 Periods	Examination : 3 Hours
Theory Periods : 4 P/Week	Internal Assessment : 20 Marks
Maximum Marks : 100	End Semester Examination : 80 Marks
Semester From Date : 01/07/2024	To Date : 12/12/2024
Name of Teaching Faculty: Er. Radha Rani Panda, Lect (ELECT)	

WEEK	PERIOD	TOPIC
1st	1 st	ELECTROLYTIC PROCESS: Definition and Basic principle of Electro Deposition.
	2 nd	Important terms regarding electrolysis.
	3 rd	Faradays Laws of Electrolysis.
	4 th	Definitions of current efficiency, Energy efficiency.
2nd	1 st	Principle of Electro Deposition.
	2 nd	Factors affecting the amount of Electro Deposition.
	3 rd	Factors governing the electro deposition.
	4 th	State simple example of extraction of metals. Application of Electrolysis.
3rd	1 st	ELECTRICAL HEATING: Advantages of electrical heating.
	2 nd	Mode of heat transfer and Stephen's Law.
	3 rd	Principle of Resistance heating. (Direct resistance and indirect resistance heating.)
	4 th	Discuss working principle of direct arc furnace and indirect arc furnace.
4th	1 st	Principle of Induction heating. Working principle of direct core type, vertical core type and indirect core type Induction furnace.
	2 nd	Principle of coreless induction furnace and skin effect.
	3 rd	Principle of dielectric heating and its application.

	4 th	Principle of Microwave heating and its application.
5 th	1 st	PRINCIPLES OF ARC WELDING: Explain principle of arc welding.
	2 nd	Discuss D. C. & A. C. Arc phenomena.
	3 rd	D.C. & A. C. arc welding plants of single and multi-operation type.
	4 th	Types of arc welding.
6 th	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.
7 th	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.
	4 th	Explain polar curves.
8 th	1 st	Describe light distribution and control. Explain related definitions like maintenance factor and depreciation factors.
	2 nd	Design simple lighting schemes and depreciation factor.
	3 rd	Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps.
	4 th	Explain Discharge lamps. State Basic idea about excitation in gas discharge lamps.
9 th	1 st	State constructional features and operation of Fluorescent lamp. (PL and PLL Lamps)
	2 nd	Sodium vapor lamps. High pressure mercury vapor lamps.
	3 rd	Neon sign lamps.
	4 th	High lumen output & low consumption fluorescent lamps.
10 th	1 st	INDUSTRIAL DRIVES: State group and individual drive.
	2 nd	Method of choice of electric drives.
	3 rd	Explain starting and running characteristics of DC motor
	4 th	Explain starting and running characteristics of AC motor.
11 th	1 st	State Application of: DC motor.
	2 nd	State Application of: 3-phase induction motor.
	3 rd	State Application of: 3 phase synchronous motors.
	4 th	State Application of: Single phase induction, series motor
12 th	1 st	State Application of: Universal motor
	2 nd	State Application of: Repulsion motor.

	3 rd	ELECTRIC TRACTION: Explain system of traction.
	4 th	System of Track electrification.
13th	1 st	Running Characteristics of DC traction motor.
	2 nd	Running Characteristics of AC traction motor.
	3 rd	Explain control of motors.
	4 th	Tapped field control.
14th	1 st	Rheostatic control.
	2 nd	Series parallel control.
	3 rd	Multi-unit control.
	4 th	Metadyne control.
15th	1 st	Explain Braking of the following types: Regenerative Braking.
	2 nd	Braking with 1-phase series motor.
	3 rd	Magnetic Braking.
	4 th	Magnetic Braking.

Panda
01/07/2024

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