



GOVERNMENT POLYTECHNIC KORAPUT

DEPARTMENT OF ELECTRICAL ENGINEERING

TH.4 UTILIZATION OF ELECTRICAL ENERGY & TRACTION

Name of the Course Diploma in Electrical Engineering Session:-			
Faculty: MR Ruhia Hansda			
Course code:	Th 4	Semester: 5th	
Total Period:	60 Periods	Examination:	3 Hrs
Theory periods:	4P/Week	Internal Assessment:	20
Tutorial:	-	End Semester Examination:	80
Maximum marks:	100		

VISION

To create competent and industry ready Electrical Diploma Engineers with professional and social values to meet future challenges.

MISSION:-

- To prepare diploma holders through "qualitative competency based education" to competent with national requirement along with core values.
- To produce dynamic electrical engineers to serve the society and industry.
- To develop leadership qualities, Communication skills, critical thinking and attitude for life-long learning

PROGRAM EDUCATIONAL OBJECTIVES:-

PEO1	Apply technical knowledge and skills learned in the field of electrical engineering to excel in professional and / or higher education.
PEO2	To provide students an excellent academic environment and make them aware the needs of society and industry to become a successful profession/entrepreneur.
PEO3	To engage in lifelong learning, career enhancement to adopt emerging technologies.

COURSE OUTCOMES:

CO1	Explain how electroplating can be used to improve the appearance and/or the resistance to corrosion of metal objects.
CO2	Understands various types of Industrial drives and their application.
CO3	Understand various methods of traction and their control.
CO4	To acquire knowledge of types of electrical heating, Illumination and analyse various types of welding

TOPICWISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	Periods
1.	Electrolytic Process	08
2.	Electrical Heating.	08
3.	Principles of Arc Welding.	08
4.	Illumination.	12
5.	Industrial Drives.	10
6.	Electric Traction.	14
Total		60



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		LESSON PLAN
Week	Day	Theory topic
1 st	1 st	1. ELECTROLYTIC PROCESS(08) 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.
2 nd	1 st	Factors affecting the amount of Electro Deposition.
	2 nd	Factors governing the Electro Deposition.
	3 rd	State simple example of extraction of metals.
	4 th	Application of Electrolysis.revision
3 rd	1 st	ELECTRCAL HEATING(8):- Advantage of electrical heating. Explain mode of heat transfer and Stephen's Law
	2 nd	Discuss principle of Resistance heating. Direct Resistance heating and Indirect Resistance heating.
	3 rd	Explain working principle of direct arc furnace and indirect arc furnace.
	4 th	Principle of Induction heating.
4 th	1 st	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	3. PRINCIPLES OF ARC WELDING(08): 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(12):- Nature of Radiation and its Spectrum.
	2 nd	Terms-luminous intensity, lumen, intensity of illumination, MHCP, MSCP, Brightness, Solid Angle, 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 maintenance factor and depreciation factor.
	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	Construction and operation of Fluorescent lamps.
	2 nd	High pressure mercury vapour lamps. Sodium vapour lamp.
	3 rd	Neon sign lamps.
	4 th	High lumen output & low consumption fluorescent lamps.
10 th	1 st	INDUSTRIAL DRIVES(10):- State group and individual drive
	2 nd	Method of choice of electric drives
	3 rd	Explain starting and running characteristics of dc and ac motor.
	4 th	State application of -Dc motor.
11 th	1 st	-3 phase induction motor.
	2 nd	-3 phase synchronous motor



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12 th	3 rd	Single phase induction motor.
	4 th	Universal motor
	1 st	Series motor
	2 nd	Repulsion motor
13 th	3 rd	ELECTRIC TRACTION(14):- Explain system of traction.
	4 th	System of track electrification
	1 st	Running characteristics of DC and AC traction motor.
	2 nd	Explain control of motor by tapped field control method.
14 th	3 rd	By rheostatic control
	4 th	Series parallel control
	1 st	Metadyne control.
	2 nd	Explain Braking of the following types-Regenerative braking.
15 th	3 rd	Regenerative braking
	4 th	Braking with 1 phase series motor.
	1 st	Braking single phase series motor.
	2 nd	Magnetic braking.
	3 rd	Magnetic braking.
	4 th	Revision. Practice Previous year question and answer.

Signature of faculty Concerned.

HOD Electrical