GOVERNMENT POLYTECHNIC KORAPUT

Th.4(ab). BASIC ELECTRICAL/ ELECTRONIC ENGINEERING

Name of the Course: Diploma in Electrical Engineering Semester duration - 25/10/22 – 31/05/23			
Faculty: Mahesh Kumar Biswal			
Course code:	Th4(ab)	**Semester**	1st and 2nd
Total Period:	60	**Examination**	3hrs
Theory periods:	4P/week	**Internal Assessment :**	20
Maximum marks:	100	**End Semester Examination:**	80

DEPARTMENT OF ELECTRICAL

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 system" to compete 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 Lifelong 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 Professional/Entrepreneur.
PEO3:	To engage in lifelong learning, career enhancement to adopt emerging technologies

Course outcomes:-

Co1	Apply the knowledge of basics mathematics and science to solve electrical & electronics engineering problems
Co2	Use of relevant technologies to be familiar with electronic circuits, AC theory and generation of electrical power
Co3	Clarify the basic knowledge of various electrical and electronics measuring instrument and transducers.
Co4	Discuss the basic communication system and calculation of commercial billing of electrical power and energy

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TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	Periods
	BASIC ELECTRICAL ENGINEERING	
1.	Fundamentals	5
2.	A C Theory	8
3.	Generation of Elect. Power	3
4.	Conversion of Electrical Energy	7
5.	Wiring and Power Billing	4
6.	Measuring Instrument	3
	BASIC ELECTRONICS ENGINEERING	
1.	Electronic Devices	8
2.	Electronic circuits	9
3.	Communication System	3
4.	Transducers & Measuring instruments	10
	TOTAL	**60**

LESSON PLAN

Week	Day	Theory topic
1st	1st	**FUNDAMENTALS:** Concept of current flow, Concept of source and load.
	2nd	State Ohm's law and concept of resistance, Relation of V, I & R in series circuit.Relation of V, I & R in parallel circuit
	3rd	. Division of current in parallel circuit. Effect of power in series & parallel circuit.
	4th	Kirchhoff's Law., Simple problems on Kirchhoff's law
2nd	1st	**A.C. THEORY**: Generation of alternating emf, Difference between D.C. & A.C
	2nd	Define Amplitude, instantaneous value, cycle, Time period, frequency, phase angle,phase difference.
	3rd	State & Explain RMS value, Average value, Amplitude factor & Form factor with Simpleproblems
	4th	Represent AC values in pharos diagrams
3rd	1st	AC through pure resistance, inductance & capacitance
	2nd	AC though RL, RC, RLC series circuits. Simple problems on RL, RC & RLC seriescircuits
	3rd	Concept of Power and Power factor, Impedance triangle and power triangle.
	4th	**ELECTRONIC DEVICES:** Basic Concept of Electronics and its application.
4th	1st	Basic Concept of Electron Emission & its types.
	2nd	Classification of material according to electrical conductivity (Conductor,Semiconductor & Insulator) with respect to energy band diagram only.

	3rd	Difference between Intrinsic & Extrinsic Semiconductor. Difference between vacuum tube& semiconductor
	4th	Principle of working and use of PN junction diode, Zener diode
5th	1st	Light Emitting Diode (LED), Integrated circuits (I.C) & its advantages.
	2nd	BJT.
	3rd	**ELECTRONIC CIRCUITS:** Rectifier & its uses.
	4th	Principles of working of different types of Rectifiers with their merits and demerits andFunctions of filters
6th	1st	classification of simple Filter circuit (Capacitor, choke input and π)
	2nd	Working of D.C power supply system (unregulated) with help of block diagrams
	3rd	Transistor, Different types of Transistor Configuration and state output and input currentgain and relationship in CE,CB and CC configuration.
	4th	Need of biasing and explain different types of biasing with circuit diagram.(only CEconfiguration)
7th	1st	Amplifiers(concept), working principles of single phase CE amplifier
	2nd	Electronic Oscillator and its classification
	3rd	Working of Basic Oscillator with different elements through simple Block Diagram
	4th	**GENERATION OF ELECTRICAL POWER**: Elementary idea on generation ofelectricity from thermal power station with block diagram
8th	1st	Elementary idea on generation of electricity from, hydro power station with blockdiagram
	2nd	Elementary idea on generation of electricity from nuclearpower station with blockdiagram
	3rd	Previous year question discussion on basic electrical
	4th	Previous year question discussion on basic electronics
9th	1st	**CONVERSION OF ELECTRICAL ENERGY:** Introduction of DC machines. Main parts ofDC machines.
	2nd	Classification of DC generator Classification of DC motor
	3rd	Uses of different types of DC generators & motors. Types and uses of single phase induction motors
	4th	Concept of Lumen Different types of Lamps (Filament, Fluorescent, LED bulb) its Construction andPrinciple.
10th	1st	Star rating of home appliances (Terminology, Energy efficiency, Star rating Concept).
	2nd	**COMMUNICATION SYSTEM**: Basic communication system (concept & explanation with help of Block diagram)
	3rd	Concept of Modulation and Demodulation, Difference between them
	4th	Different types of Modulation (AM, FM & PM) based on signal, carrier wave andmodulated wave
11th	1st	**TRANSDUCERS AND MEASURING INSTRUMENTS**: Concept of Transducer andsensor with their differences.
	2nd	Different type of Transducers & concept of active and passive transducer
	3rd	Working principle of photo emissive, photoconductive, photovoltaic transducer and its application.
	4th	Multimeter and its applications
12th	1st	Analog and Digital Multimeter and their differences Working principle of Multimeter with Basic Block diagram

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	2nd	CRO, working principle of CRO with simple Block diagram
	3rd	**WIRING AND POWER BILLING**: Types of wiring for domestic installations.
	4th	Layout of household electrical wiring (single line diagram showing all the importantcomponent in the system
13th	1st	List out the basic protective devices used in house hold wiring.
	2nd	Calculate energy consumed in a small electrical installation
	3rd	**MEASURING INSTRUMENTS**: Introduction to measuring instruments. Torques ininstruments.
	4th	Different uses of PMMC type of instruments (Ammeter & Voltmeter).
14th	1st	Different uses of MI type of instruments (Ammeter & Voltmeter).
	2nd	Draw the connection diagram of A.C/ D.C Ammeter, voltmeter (Single phase only)
	3rd	Draw the connection diagram of A.C/ D.C energy meter andwattmeter(Single phase only)
	4th	Revision : chapter 1,2,3 (basic electrical engineering)
15th	1st	Revision : chapter 4,5,6 (basic electrical engineering)
	2nd	Revision : chapter 1,2 (basic electronics engineering)
	3rd	Revision : chapter 3,4 (basic electronics engineering)
	4th	Discuss of previous year paper question and answers

Satya 25/10/22
Signature
HOD (Math & Sc)

Mahesh Ku Behera
Signature of faculty 25/10/22