DEPARTMENT OF ELECTRICAL ENGINEERING

GOVERNMENT POLYTECHNIC, BARGARH

LESSON PLAN

ANALOG ELECTRONICS AND OP-AMP (TH 2)

4TH SEMESTER

ELECTRICAL ENGINEERING

DEPARTMENT OF ELECTRICAL ENGINEERING

VISION:

To produce Electrical Engineer professionals who can contribute for socio-economic and technological development to meet global needs.

MISSION:

M1 - To strengthen academic infrastructure leading to quality professional by using modern technical tools and technologies.

M2 - To impart innovative knowledge among the students and make more industry-institution programs to make them successful professionals for serving the society.

M3 - To provide a learning environment to improve problem solving abilities, leadership abilities, ethical responsibilities and lifelong learning.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO1: Apply electrical engineering knowledge and practical skills to solve well-defined engineering problems using modern tools and techniques.

PEO2: Perform effectively in industry and society as competent junior engineer, supervisors, or entrepreneurs with ethical and sustainable engineering practices.

PEO3: Demonstrate teamwork, communication, leadership, and project management skills in professional engineering activities.

PEO4: Engage in lifelong learning and adapt to emerging technologies for career growth and higher education.

PROGRAM SPECIFIC OUTCOMES

The electrical diploma engineers will be able to:

PSO1:-Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate engineering problems of electric circuits, analog and digital electronics, control system, electrical machines and power system.

PSO2:- Apply the appropriate techniques and modern engineering hardware and software tools in electrical engineering to engage in life-long learning and to successfully adapt in multidisciplinary environments.

PSO3:-Work professionally in power systems engineering, Electrical machinery and electrical circuit.

Week	Class No.	Topic
Week 1	1	Introduction to Semiconductor Materials and PN Junction
	2	PN Junction Diode – Construction and Symbol
	3	Working of PN Junction Diode
	4	Forward Bias and Reverse Bias Operation
Week 2	5	V-I Characteristics of PN Junction Diode
	6	DC Load Line of Diode Circuit
	7	Ideal Diode and Practical Diode
	8	Knee Voltage and Diode Parameters
Week 3	9	Junction Breakdown Phenomenon
	10	Zener Breakdown
	11	Avalanche Breakdown
	12	Diode Clipping Circuits
Week 4	13	Diode Clamping Circuits
	14	Introduction to Special Semiconductor Devices
	15	Thermistors – Construction and Applications
	16	Sensors and Barretters
Week 5	17	Zener Diode – Characteristics and Applications
	18	Tunnel Diode – Construction and Working
	19	PIN Diode – Construction and Applications
	20	Numerical Problems and Revision
Week 6	21	Classification of Rectifiers
	22	Half Wave Rectifier – Circuit and Operation
	23	Half Wave Rectifier – DC and RMS Values
	24	Full Wave Centre-Tapped Rectifier
Week 7	25	Full Wave Rectifier – Performance Parameters
	26	Bridge Rectifier – Circuit and Working
	27	Rectifier Efficiency and Ripple Factor
	28	Voltage Regulation and TUF
Week 8	29	Peak Inverse Voltage Calculations
	30	Shunt Capacitor Filter
	31	Choke Input Filter
	32	π (Pi) Filter
Week 9	33	Rectifier and Filter Numerical Problems
	34	Introduction to Bipolar Junction Transistor (BJT)
	35	Principle of Operation of BJT
	36	Modes of Operation of Transistor
Week 10	37	Current Components in a Transistor
	38	Transistor as an Amplifier
	39	CB Configuration and Characteristics
	40	CE Configuration and Characteristics
Week 11	41	CC Configuration and Characteristics
	42	Need for Transistor Biasing
	43	Stabilization and Stability Factor
	44	Base Resistor Bias Method
Week 12	45	Collector-to-Base Bias Method
	46	Self Bias (Voltage Divider Bias) Method

	47	Biasing Circuit Numerical Problems
	48	Practical Transistor Amplifier Circuit
Week 13	49	DC Load Line and DC Equivalent Circuit
	50	AC Load Line and AC Equivalent Circuit
	51	Calculation of Amplifier Gain and Phase Reversal
	52	H-Parameters and Simplified H-Parameter Model
Week 14	53	Analysis of CB, CE and CC Amplifiers
	54	Multistage Amplifiers (RC and Transformer Coupled)
	55	Feedback in Amplifiers and Negative Feedback
	56	Power Amplifiers: Class A, Class B and Push-Pull Amplifiers
Week 15	57	Oscillators: Types and Essentials of Oscillation
	58	Hartley, Colpitts, Phase Shift, Wien Bridge Oscillators
	59	Field Effect Transistor (FET): Classification, Parameters and Biasing
	60	Operational Amplifiers: 741 OP-AMP, Inverting, Non-Inverting, Integrator, Differentiator, Comparator and Course Revision

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