BIT POLYTECHNIC,BALASORE

LESSON PLAN

Semester: 4th **Subject: ANALOG ELECTRONICS & LINEAR IC**

Branch: ETC **Name of the Faculty Member: Er. Goutam Dutta**

Period	Unit	Topic to be covered
1	Unit -1	**DIODE, TRANSISTORS AND CIRCUITS.** **Working principle, of Diode & its current equation**
2		Specification and use of p-n junction diode.
3		Breakdown of diode (Avlance&Zener Breakdown) and Construction, working, Characteristics
4		Classification of Rectifiers and working of different types of Rectifiers- Half-Wave Rectifier,
5		Full-Wave Rectifier (CT & BRIDGE type)
6		Working principle of p-n-p and n-p-n transistor
7		Different types of transistor connection (CB, CE and CC)& input and output characteristics of transistor in different connections.
8		Define ALPHA, BETA and GAMMA of transistors in various modes. Establish the Mathematical relationship between them.
9		Basic concept of Biasing, Types of Biasing ,h-parameter model of BJT, load line (AC &DC) and determine the Q-point.
10		Types of Coupling, working principle and use of R-C Coupled Amplifier & Frequency Responses of R-C coupled Amplifier & draw the curve.
		OMR-1
11	UNIT -2	**INTERDUCTION TO AUDIO POWER AMPLIFIERS.**
12		Classify Power Amplifier
13		Differentiate between Voltage and Power Amplifier.
14		Working principle of different types of Power Amplifier Class-A
15		Working principle Class-AB, Class-B
16		Working principle Class-C & Class D amplifier
17		Construction and working principle Push Pull (Class-B) Amplifiers
18		advantages of Push Pull (Class-B) Amplifiers **OMR-2**
19	UNIT -3	**INTERDUCTION TO FIELD EFFECT TRANSISTOR (FET).**
20		FET & its classifications
21		Differentiate between JFET & BJT
22		Construction, working principle & characteristics of JEFT
23		Explain JEFT as an amplifier

24		Parameters of JFET& Establish relation among JFET parameters.
25		Construction & working principle MOSFET
26		its classification & characteristics (Drain & Transfer)
27		Explain the operation of CMOS
28		Explain the operation of VMOS & LDMOS **OMR-3**
29	**UNIT -4**	**INTERDUCTION TO FEED BACK AMPLIFIER & OSCILLATOR**
30		Define & classify Feedback Amplifier
31		Principle of negative feedback with the help of block diagram, Types of feedback – negative &positive feedback.
32		Types of negative feedback – voltage shunt, voltage series
33		Current shunt& current series and characteristics voltage gain, bandwidth, input Impedance output impedance, stability, noise , distortion in amplifiers.
34		Oscillator -block diagram of sine wave oscillator ,Types Requirement of oscillation-Barkhausen criterion
35		RC oscillators – RC phase shift ,Crystal - Circuit operation, circuit diagram, equation for frequency of oscillation & frequency stability
36		LC oscillators – Colpitts , Hartley & Wien Bridge Oscillators :Circuit operation, circuit diagram, equation for frequency of oscillation & frequency stability **OMR-4**
37	**UNIT -5**	**INTERDUCTION TO TUNED AMPLIFIER & WAVE SHAPING CIRCUIT**
38		Defined and classify Tuned amplifier
39		Explain parallel Resonant circuit, Resonance Curve & sharpness of Resonance.
40		working principle of Single tuned Voltage Amplifier
41		working principle of Double tuned Amplifier & its limitation
42		Different type of Non-linear circuits
43		Clipper, diode series &shunt, positive& negative biased & unbiased and combinational clipper clippers circuit & its application.
44		Different type of Clamper circuit (positive & negative clampers) & its application.
45		Working of Astable multivibrator with circuit diagram.
46		Monostable & BistableMultivibrator with circuit diagram.
47		Working& use of Integrator circuit using R- C circuit (Linear), input / output waveforms & frequency response.
48		Working& use of Differentiator circuit using R- C circuit (Linear), input / output waveforms & frequency response. **OMR-5**

49	UNIT -6	**INTERDUCTION TO OPERATIONAL AMPLIFIER CIRCUITS & FEEDBACK CONFIGURATIONS**
50		Differential amplifier & explain its configuration &significance.
51		Block diagram representation of a typical Op- Amp, its equivalent circuits and draw the schematic symbol
52		Discuss the types of integrated circuits manufacturer's designations of ICs
53		Package types, pin identification and temperature and ordering information.
54		Define the following electrical characteristics input offset voltage, input offset current
55		CMMR, Large signal voltage gain, Slew rate.
56		Draw and explain the Open Loop configuration (inverting, non-inverting Amplifier)
57		Draw the circuit diagram of the voltage series feedback amplifier and derive the close loop Voltage gain
58		Gain of feedback circuits input resistance, and output resistance.
59		Bandwidth and total output offset voltage with feedback.
60		Draw the circuit diagram of the voltage shunt feedback amplifier and derive the close loop, Voltage gain,
61		Gain of feedback circuits and input resistance of various feedback circuits.
62		Calculation of output resistance of various feedback circuits.
63		Bandwidth and total output offset voltage with feedback. **OMR-6**
64	UNIT -7	**Discussion on application Of Operational Amplifier**
65		Discuss the summing scaling and averaging of inverting Amplifier
66		Discuss the summing scaling and averaging of non-inverting amplifiers
67		DC & AC Amplifies using OP-AMP.
68		Integrator and differentiator using op-amp.
69		Active filter ,difference between active and passive filter
70		describe the filter design of fast order low Pass Butterworth Concept of Zero-Crossing Detector using Op-Amp
71		Block diagram and operation of IC 555 timer &IC 565 PLL& its applications. Working of Current to voltage Convertor using Operational Amplifier
72		Working of the Voltage to Frequency Convertor using Operational Amplifier.
73		Working of the Frequency to Voltage Conversion using Operational Amplifier.
74		Operation of power supply using 78XX and 79XX,LM 317 Series with their PIN configuration
75		Functional block diagram & Working of IC regulator LM 723 & LM 317. **OMR-7**