# GANDHISCHOOLOFENGINEERING

## BHABANDHA,BERHAMPUR

**BRANCH:-ELECTRONICS&TELECOMMUNICATIONENGINEERING**

**SEMESTER:-4TH**

**SUBJECT:-**ANALOGELECTRONICS & LINEAR IC

**NameoftheFaculty-ER. Satyabrata Tripathy**

| | | Topictobetaken | | | | Actual topictaken | | |
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| **Sl. No** | **Topic/Module** | **No.ofperiod** | **Detailsofthetopics** | **Date** | **TopicNo.** | **TopicName** | **Date** | **Remarks** |
| 1 | DIODE, TRANSISTORSAND CIRCUITS. | 10 | 1.1 Working principle, of Diode & its current equation, Specification anduse of p-n junction diode. 1.2 Breakdown of diode(Avlance&ZenerBreakdown)and Construction,working,Characteristics1.3 ClassificationofRectifiersandworkingof differenttypesofRectifiers-Half-Wave Rectifier,Full-WaveRectifier(CT&BRIDGE type)1.4Workingprincipleofp-n-pandn-p-ntransistor,differenttypesoftransistor connection(CB,CEandCC)&inputand outputcharacteristicsoftransistorin differentconnections.1.5DefineALPHA, BETAandGAMMAoftransistorsinvarious modes.EstablishtheMathematical relationshipbetweenthem.1.6Basic conceptofBiasing,TypesofBiasing,h-parametermodelofBJT,loadline(AC &DC)anddeterminetheQ-point.1.7 TypesofCoupling,workingprincipleand useofR-CCoupledAmplifier&Frequency ResponsesofR-CcoupledAmplifier& drawthecurve. | 18/01/2024 TO 03/02/2024 | 1.1<br><br>1.2<br><br>1.3<br><br>1.4 | Working principle, of Diode & its current equation, Specification and use of p-n junction diode.<br><br>Breakdown of diode (Avlance&Zener Breakdown) and Construction, working, Characteristics<br><br>Classification of Rectifiers and working of different types of Rectifiers- Half-Wave Rectifier, Full-Wave Rectifier (CT & BRIDGE type)<br><br>Working principle of p-n-p and n-p-n transistor, different types of transistor connection (CB, CE and CC)& input and output characteristics of transistor in different connections. | 18/01/2024 &18/01/2024<br><br>19/01/2024<br><br>20/01/2024 &24/01/2024<br><br>25/01/2024 &28/01/2024 &31/01/2024 | |

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| | | | | | 1.5 | Define ALPHA, BETA and GAMMA of transistors in various modes. Establish the Mathematical relationship between them. | 01/02/2024 | |
| | | | | | 1.6 | Basic concept of Biasing, Types of Biasing,h-parameter model of BJT,load line (AC &DC) and determine the Q-point. | 02/02/2024 | |
| | | | | | 1.7 | Types of Coupling, working principle and use of R-C Coupled Amplifier & Frequency Responses of R-C coupled Amplifier & draw the curve. | 03/02/2024 | |
| 2 | AUDIOPOWER AMPLIFIERS. | 08 | 2.1ClassifyPowerAmplifier &DifferentiatebetweenVoltageand PowerAmplifier.2.2Workingprincipleof differenttypesofPowerAmplifier(Class-A,Class-AB,Class-BandClass-C&ClassD amplifier). 2.3 Construction and working principle and advantages of Push Pull (Class-B) Amplifiers | 06/02/2024 TO 15/02/2024 | 2.1 | ClassifyPowerAmplifier &DifferentiatebetweenVoltage andPowerAmplifier. | 06/02/2024 | |
| | | | | | 2.2 | Working principle of different types of Power Amplifier (Class-A, Class-AB, Class-B and Class-C & Class D amplifier). | 07/02/2024 &08/02/2024 &09/02/2024 & 10/02/2024 & 13/02/2024 | |
| | | | | | 2.3 | Constructionandworking principleandadvantagesofPush Pull(Class-B)Amplifiers | 15/02/2024 | |

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| 3 | FIELD EFFECT TRANSISTOR(FET). | 10 | 3.1 FET & its classifications &Differentiate between JFET & BJT. 3.2 Construction, working principle & characteristics of JEFT&ExplainJEFTasanamplifier,parameters ofJFET&EstablishrelationamongJFET parameters. 3.3 Construction & working principle MOSFET & its classification & characteristics (Drain & Transfer) 3.4 Explain the operation of CMOS, VMOS &LDMOS. | 16/02/2024 TO 28/02/2024 | 3.1<br><br><br><br>3.2<br><br><br><br><br><br><br>3.3<br><br><br><br><br><br>3.4 | FET & its classifications &Differentiate between JFET &BJT.<br><br>Construction, working principle & characteristics of JEFT &Explain JEFT as an amplifier, parametersof JFET & Establish relation among JFET parameters.<br><br>Construction&workingprinciple MOSFET&itsclassification& characteristics(Drain&Transfer)<br><br>Explain the operation of CMOS, VMOS & LDMOS. | 16/02/2024<br><br><br><br>17/02/2024 &20/02/2023 &21/02/2024 & 22/02/2024<br><br><br><br>22/02/2024 & 23/02/2024 & 24/02/2024<br><br>27/02/2024 &28/02/2024 | |
| 4 | FEED BACK AMPLIFIER&OSCILLATOR | 08 | 4.1 Define & classify Feedback Amplifier, principle of negative feedback with thehelp of block diagram, Types of feedback – negative &positive feedback. 4.2 Types of negativefeedback– voltageshunt, voltage series, current shunt& current series and characteristics voltage gain, bandwidth , input Impedance output impedance, stability, noise , distortion in amplifiers. 4.3 Oscillator - block diagram of sinewaveoscillator,TypesRequirement of oscillation Barkhausen criterion 4.4 RC oscillators – RC phase shift ,Crystal, LC oscillators – Colpitts , Hartley & Wien BridgeOscillators:Circuitoperation,circuit diagram, equation for frequency of oscillation & frequency stability | 29/02/2024 TO 12/03/2024 | 4.1<br><br><br><br><br>4.2<br><br><br><br><br><br><br><br>4.3 | Define & classify Feedback Amplifier, principle of negative feedback with the help of block diagram, Types of feedback – negative &positive feedback.<br><br>Types of negative feedback – voltage shunt, voltage series, current shunt& current series and characteristics voltage gain, bandwidth , input Impedance output impedance, stability, noise ,distortioninamplifiers.<br><br>Oscillator -block diagram of sine wave oscillator ,Types Requirement of oscillation ,Barkhausencriterion | 29/02/2024<br><br><br><br><br>29/02/2024 &01/03/2024 &02/03/2024<br><br><br><br>02/03/2024 | |

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| | | | | | 4.4 | RCoscillators–RCphaseshift ,Crystal,LCoscillators–Colpitts, Hartley&WienBridgeOscillators :Circuitoperation,circuitdiagram, equationforfrequencyof oscillation&frequencystability | 06/03/2024 &07/03/2024 &12/03/2024 | |
| 5 | TUNED AMPLIFIER & WAVE SHAPING CIRCUIT | 12 | 5.1 Defined and classify Tuned amplifier, Explain parallel Resonant circuit, Resonance Curve & sharpness of Resonance.5.2workingprincipleofSingle tunedVoltage&DoubletunedAmplifier& itslimitation5.3DifferenttypeofNon-linearcircuits-Clipper,diodeseries &shunt, positive& negative biased & unbiased and combinational clipper clipperscircuit&itsapplication.5.4 DifferenttypeofClampercircuit(positive &negativeclampers)&itsapplication.5.5 WorkingofAstable, Monostable&BistableMultivibratorwith circuitdiagram.5.6Working&useof IntegratorandDifferentiatorcircuitusing R-Ccircuit(Linear),input/output waveforms&frequencyresponse. | 13/03/2024 TO 29/03/2024 | 5.1<br><br><br><br><br>5.2<br><br><br><br>5.3<br><br><br><br><br><br><br>5.4<br><br><br><br>5.5<br><br><br><br>5.6 | Defined and classify Tuned amplifier, Explain parallelResonant circuit, Resonance Curve & sharpness of Resonance.<br><br>working principle of Single tuned Voltage& Double tuned Amplifier & its limitation<br><br>DifferenttypeofNon-linear circuits-Clipper,diodeseries &shunt,positive&negativebiased &unbiasedandcombinational clipperclipperscircuit&its application.<br><br>DifferenttypeofClampercircuit (positive&negativeclampers)& itsapplication.<br><br>WorkingofAstable,Monostable& BistableMultivibratorwithcircuit diagram.<br><br>Working&useofIntegratorand DifferentiatorcircuitusingR-C circuit(Linear),input/output waveforms&frequencyresponse. | 13/03/2024 &14/03/2024<br><br><br><br>15/03/2024<br><br><br><br>19/03/2024 &20/03/2024<br><br><br><br>21/03/2024 &22/03/2024<br><br>27/03/2024 &28/03/2024<br><br>28/03/2024 &29/03/2024 | |
| 6 | OPERATIONAL AMPLIFIER CIRCUITS &FEEDBACK CONFIGURATIONS | 14 | 6.1 Differential amplifier & explain its configuration &significance. 6.2 Block diagram representation of a typical Op-Amp, its equivalent circuits and draw the schematic symbol 6.3 Discuss the types of integrated circuits manufacturer's | 29/03/2024 TO 16/04/2024 | 6.1<br><br><br>6.2 | Differential amplifier & explain its configuration &significance.<br><br>Block diagram representation of a typical Op- Amp, its equivalent circuits and draw the schematic | 29/03/2024<br><br><br>30/03/2024 | |

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| | | | designationsofICs,Packagetypes,pin identificationandtemperatureand orderinginformation.6.4Definethe following electrical characteristics input offset voltage, input offset current,CMMR, Large signal voltage gain, Slewrate . 6.5 Draw and explainthe Open Loop configuration(inverting,non-inverting Amplifier)6.6Drawthecircuitdiagramof thevoltageseriesfeedbackamplifierand derivethecloseloopVoltagegain,gainof feedbackcircuitsinputresistance,and outputresistance,bandwidthandtotal outputoffsetvoltagewithfeedback.6.7 Drawthecircuitdiagramofthevoltage shuntfeedbackamplifierandderivethe close loop, Voltage gain, gain of feedback circuits and input resistance, and output resistance,bandwidthandtotaloutput offsetvoltagewithfeedback. | | 6.3<br><br>6.4<br><br>6.5<br><br>6.6<br><br>6.7 | symbol<br><br>Discuss the types of integrated circuits manufacturer's designations of ICs, Package types, pin identification and temperature and ordering information.<br><br>Definethefollowingelectrical characteristicsinputoffset voltage,inputoffsetcurrent, CMMR,Largesignalvoltagegain, Slewrate.<br><br>Draw and explain the Open Loop configuration (inverting, non-inverting Amplifier)<br><br>Drawthecircuitdiagramofthe voltageseriesfeedbackamplifier andderivethecloseloopVoltage gain,gainoffeedbackcircuits inputresistance,andoutput resistance,bandwidthandtotal outputoffsetvoltagewith feedback.<br>Drawthecircuitdiagramofthe voltageshuntfeedbackamplifier andderivethecloseloop,Voltage gain,gainoffeedbackcircuitsand inputresistance,andoutput resistance,bandwidthandtotal outputoffsetvoltagewith feedback. | 02/04/2024<br><br>02/04/2024<br><br>02/04/2024 &03/04/2024<br><br>04/04/2024 &05/04/2023 &06/04/2024 &09/04/2024<br><br>10/04/2024 &12/04/2024 &13/04/2024 &16/04/2024 | |

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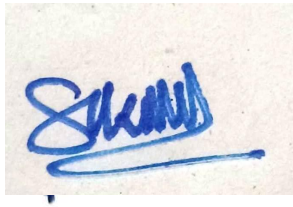
| 7 | APPLICATIONOF OPERATIONAL AMPLIFIER,TIMER CIRCUITS&IC voltageregulator | 13 | 7.1Discussthesummingscalingand averaging of inverting and non-inverting amplifiers 7.2 DC & AC Amplifies using OP-AMP.7.3Integratoranddifferentiator usingop-amp.7.4Activefilterand describethefilterdesignoffastorderlow PassButterworth7.5ConceptofZero-CrossingDetectorusingOp-Amp7.6Block diagramandoperationofIC555timer&IC 565PLL&itsapplications.7.7Workingof CurrenttovoltageConvertorusing OperationalAmplifier7.8Workingofthe VoltagetoFrequencyConvertorusing OperationalAmplifier.7.9Workingofthe FrequencytoVoltageConversionusing OperationalAmplifier.7.10Operationof powersupplyusing78XXand79XX,LM 317SerieswiththeirPINconfiguration 7.11 Functional block diagram & Working of IC regulator LM 723 & LM 317. | 18/04/2024 TO 22/05/2023 | 7.1 | Discussthesummingscalingand averaging of inverting and non-inverting amplifiers | 18/04/2024 | |
| | | | | | 7.2 | DC&ACAmplifiesusingOP-AMP. | 19/04/2024 | |
| | | | | | 7.3 | Integrator and differentiator using op-amp. | 20/04/2024 | |
| | | | | | 7.4 | Activefilteranddescribethefilter designoffastorderlowPass Butterworth | 23/04/2024 | |
| | | | | | 7.5 | Concept of Zero-Crossing Detector using Op-Amp | 24/04/2024 | |
| | | | | | 7.6 | Block diagram and operation of IC 555 timer &IC 565 PLL& its applications. | 24/04/2024 | |
| | | | | | 7.7 | WorkingofCurrenttovoltage ConvertorusingOperational Amplifier | 24/04/2024 | |
| | | | | | 7.8 | WorkingoftheVoltageto FrequencyConvertorusing OperationalAmplifier. | 25/04/2024 | |
| | | | | | 7.9 | WorkingoftheFrequencyto VoltageConversionusing OperationalAmplifier. | 25/04/2024 | |
| | | | | | 7.10 | Operationofpowersupplyusing 78XXand79XX,LM317Serieswith theirPINconfiguration | 25/04/2024 | |
| | | | | | 7.11 | Functionalblockdiagram& WorkingofICregulatorLM723& LM317. | 26/04/2024 | |



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