NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - I
ELECTRONICS MATERIALS AND COMPONENTS

Teaching scheme:
Lectures : 4 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours).
Term Work : 25 Marks

UNIT – I

Electrical conducting materials, Copper, Aluminum, Tungsten, Carbon and Graphite, Nickel, Lead, Tin-Alloys, properties and applications; Insulating materials, Mica, porcelain, Marble and Slate, Polythene, Bakelite, Polyvinyl chloride, Asbestos, Rubber, Cotton and Silk, Glass, Paper and Boards, Wood, Enamel covering, Semiconductor materials-Classification of semiconductors;-Elemental semiconductors-Antimony, Arsenic .Selenium. Gallium Silicon and Germanium, Compound Semiconductors -GaAs. Amorphous semiconductor:-Ge, Si, Se, Te, properties and applications; Magnetic materials:-Soft magnetic materials, Electrical steels, Hard magnetic materials, Magnetic recording, magnetic memories. Metallic glasses. Dielectric materials:-Capacitor structure, Multi layer capacitor dielectric . Lead Zirconate Titanate (LZT), PLZT system.

Lectures-10, Marks -20

UNIT – II

Passive components: Resistors: - Fixed type, carbon composition, carbon film, metal film: construction and characteristics; Variable resistors, carbon potentiometer, and wire-bound potentiometer: construction and characteristics. Tolerance of various resistors. Capacitors: - fixed type, electrolytic, aluminium type, tantalum type, ceramic capacitors, polystyrene, polyester capacitors, mica capacitor and paper capacitor, variable capacitor: construction and properties of each type. Inductors: - fixed type, air-core, ferrite-core inductors and variable inductors: construction and characteristics. Transformers:-Construction, Operation and types- power transformer, IF, AF and RF. Losses in transformers-Core losses, Eddy current Losses, Residual Losses Applications.

Lectures-10, Marks -20

UNIT - III

Discrete devices: Fabrication of discrete and monolithic devices, Semiconductor processing:-Zone refining Mono crystallization, Floating Zone method, vaferization. Diodes:- alloy junction, Crystals, Grown junctions, Solid diffusion, and Gaseous diffusion. Epitaxial diodes. Point contact diode, Schottky barrier diode, Zener diodes, power diodes, Tunnel diodes. Light emitting diodes. BJT Fabrication:-Alloy junction, Point contact, Diffusion, Power transistors,. junction, Diffused junction and Epitaxial techniques, JFET; Fabrication:-MOSFET Fabrication, Depletion MOSFET- Enhancement – MOSFET, C-MOS. V-MOS. Alloy junction, Diffused junction and Epitaxial techniques .UJT Fabrication, Pellet type SCR, Annular SCR, DIAC Fabrication,

Lectures-10, Marks -20

UNIT –IV

Fabrication of Optoelectronic Devices: LDR Phototransistor, LASCR, SUS, LCD, Seven segment displays.
Integrated circuits: Monolithic integrated circuits, chip and component size, photolithographic masking, fabrication: IC resistors, capacitors, diodes and transistors; fabrication of epitaxial- diffused integrated circuits. Thermo-compressic bonding of lead and packaging of ICs.

Lectures-10, Marks -20

UNIT –V

Printed Circuit Boards: Base and conducting materials, artwork, copper clad laminates: properties and types, Design rules for analog circuit PCBs, Design rules for PCBs in power electronics application, Design rules for PCBs in microwave application, photographic etching techniques, mass-soldering techniques, mounting of components, final protection, multilayered flexible PCB.

Lectures-10, Marks -20

REFERENCES:

1. C.S. Indulkar, S.Thiruvengadam: An Introduction to Electrical Engineering Materials, S Chand and Company. 3/e
2. Salivahanan, Suresh Kumar, Vallavaraj : Electronic Devices and Circuits, TMH publication.
3. Allison: Electronic Engineering Materials and Devices, TMH publication.
4. W. Bosshart : Printed Circuit Boards: Design and Fabrication, TMH publication.
5. S.M. Dhir: Electronic components and materials

Note: The term work should include minimum FIVE assignments based on above syllabus, ONE from each unit.

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - I
ELECTRONICS INSTRUMENTATION

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 2 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 25 Marks

UNIT – I

Measurement and error : Definitions, instruments, accuracy, precision, sensitivity , resolution error, accuracy and precision , significant figures, types of error , gross error, systematic error, random error, statistical analysis, arithmetic mean, average deviation, standard deviation, probable error and limiting errors.

Units of measurement: Fundamental and derived units, systems of unit - CGS, MKS and SI. Standards of measurement: Classification of standards, international standards, primary standard, secondary standard, working standard, IEEE standards.

Calibration – Primary calibration , Secondary Calibration, Indirect Calibration, Routine Calibration, Fundamentals elements of Measurement System.

Lectures-10, Marks -20

UNIT – II

Electromechanical Indicating Instruments : Permanent magnet moving coil mechanism (PMMC) , D'Arsonal movement , multirange DC ammeter , multirange DC volt meter sensitivity , loading effect , voltmeter - ammeter methods of measuring resistance , series type ohm meter, shunt type ohm meter, multimeter, calibration of DC instruments , AC indicating instruments , electrodynamometer , rectifier type instruments , typical multimeter circuits, electrodynamometer in power measurements, single phase watt meter , watt –hour-meter, power factor meter. Lectures-10, Marks -20

UNIT – III

Bridges and their applications : Wheatstone bridge, measurement errors, sensitivity, Kelvin bridge, guarded wheatstone bridge, Mega ohm bridge, AC bridge, conditions for bridge balance, inductance comparison bridge, capacitance comparison bridge, maxwell bridge, Hay bridge, Schering bridge, Wein bridge, Wagner ground connections. Lectures-10, Marks -20

UNIT – IV

Electronic instruments: Electronic dc and ac voltmeter, electronics multimeter, digital voltmeter - ramp type, Integration continuous balance and successive approximation type.

Recorders : Galvanometric, servo potentiometer, magnetic and digital data recording, printers.

Lectures-10, Marks -20

UNIT – V

Transducers and application: characteristic and applications of Strain gauges, capacitive transducer, Inductive transducer, linear variable differential transformer (LVDT), potentiometric transducer, thermister, thermocouple, thermostat ,Acoustical transducers - microphone, speakers., Instrumentation amplifier, RTD, pressure transducer, flow transducer, pyrometer, luxmeter. Lectures-10, Marks -20

REFERENCES:

1) Cooper and Helfric : Electronics Instrumentation and measurement technique, Pearson LPE
2) H.S. Kalsi : Electronics Instrumentation, TMH 2/e
3) A.K.Sawhney: Electrical and Electronics measurement and Instrumentation, Dhanpat Rai and compony.

LIST OF EXPERIMENTS:-

Group A

1) (a) Study of single phase wattmeter.
   (b) Study of single phase watt hour meter.
2) Study of Wheat stone bridge
3) Study of Kelvin bridge
4) Study of Maxwell bridge
5) Study of Hay bridge
6) Study of Schering bridge

Group B

7) Study of Wein bridge
8) Study of digital voltmeter
9) Study of Recorder
10) Study of Instrumentation amplifier
11) Study of Linear variable differential transformer
12) Application of thermistor for temperature control

The term work should include a minimum EIGHT experiments. FOUR from group A and FOUR from group B .

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - I
DIGITAL CIRCUITS AND LOGIC DESIGN

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 2 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 25 Marks

UNIT – I

Characteristics of digital IC's , TTL, Schottkey TTL , ECL, Interfacing ECL and TTL, MOS Logic, CMOS Logic, Interfacing of CMOS and TTL.
Loading rules for logic families, switching times, digital signals, positive and negative logic

Lectures-10, Marks -20

UNIT – II

Binary arithmetic, Signed binary numbers, Binary codes : Exess-3, Gray, BCD, ASCII , parity bit, hamming code .Boolean algebra, Demorgan's theorems , Minimization of logic functions using K-map, Canonical forms, min terms, max terms, don't care conditions, variable entered mapping (VEM) , code converters

Lectures-10, Marks -20

UNIT – III

Combinational Logic Circuits Design: Arithmetic circuits, half and full adder, half and full subtractor, binary parallel adder, 7483, BCD adder, BCD subtractor, Excess-3 adder, digital comparator, Multiplexers, Demultiplexers, decoders, Arithmetic logic unit (ALU – 74181), Carry look ahead generator.

Lectures-10, Marks -20

UNIT – IV

Sequential logic circuits : Flip flops (SR, JK, MSJK, D, T), excitation table, design of ripple counter using flip flop and IC's, 4- bit Up / Down ripple counter, shift register, universal register and application

Lectures-10, Marks -20

UNIT – V

Synchronous Sequential Machine: Synchronous counters, Mod- N counter, synchronous counters using 74191, design of Sequential generator. Moore Mealy machines, state diagram, state table, application to sequential generator, Introduction to array

Lectures-10, Marks -20

REFERENCES:

1. R.P. Jain : Modern digital electronics , TMH 3/e
2. Morris Mano : Digital logic and computer design, Pearson LPE
3 Macrovitz : Introduction to logic design . TMH 2/e
4 Taub and Schilling : Digital integrated electronics, Mc Graw Hill
5 Gothman : Digital electronics : An Introduction to Theory and Practice, PHI 2/e
6. William Fletcher : Engineering approach to Digital design, PHI
7. Givone : Digital principles and Design , TMH
8. Malvino , Leach : Digital principle and Applications

LIST OF EXPERIMENTS

GROUP - A

1. Design and implement circuit using NAND or NOR gate to perform the Boolean expression
2. Design and implement BCD to Exess-3 code converter
3. Design and implement 4- bit binary to Gray code converter
4. Implement 4-bit binary adder using IC 7482 and IC 7483
5. Implement BCD to 7- segment decoder using IC 7447/7448
6. Implement BCD adder using 7483
7. Implement 4 – bit comparator using IC 7485
8. Implement arithmetic logic unit using IC 74181

GROUP – B

1. Verify the truth table of multiplexer and demultiplexer ICs
2. Implement the logical expression using multiplexer IC and gates
3. Implement the logical expression using demultiplexer IC and gates
4. Implement and verify S-R, J-K,D, and T flip flop using ICs
5. Implement 4- bit ripple counter using IC 7493
6. Design and Implement Mod -6 synchronous counter
7. Implement decade up- down counter using ICs
8. Implement shift register using 7495.

The term work should include a minimum EIGHT experiments. FOUR from group A and FOUR from group B.

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W.E.F 2006 -2007
TERM - I
ELECTRICAL CIRCUITS AND MACHINES

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 2 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks

UNIT – I

DC circuits: circuit definitions, sources of energy, source conversion, mesh analysis, nodal analysis, Thevinin`s theorems, Norton`s theorem, superposition theorem, maximum power transfer theorem,

Three phase circuits : Three phase supply, phase sequence , star and delta connection of three phase winding, line and phase voltages and currents in star and delta connections, power in three phase circuit with balance load for star and delta connections, measurement of three phase power by three watt meter method, two Watt meter method , single watt meter method, calculation of active and reactive power. Lectures-10, Marks -20

UNIT – II

DC Machines : construction ,types ,generator action, emf equation motor action , significance of back emf , torque and speed equations , characteristics of shunt , series , compound motors, speed control methods , starters , theoretical treatment of losses and power flow diagram of dc machines, applications of dc machines. Lectures-10, Marks -20

UNIT – III

Transformers : Single phase transformer construction , emf equation , transformer on no load , transformer on load , phasor diagram, equivalent circuit, efficiency and regulation, open circuit and short circuit tests,

Three – phase transformers : star / star, delta / delta, star / delta, delta / star connections, V-V and scott connections, Autotransformer, C.T. and P.T. Lectures-10, Marks -20

UNIT – IV

Synchronous Machines : Alternators – principle of operation , constructional features, emf equation, winding factors, voltage regulation by synchronous impedance method.

Synchronous Motors: principle of operation, rotating magnetic field, on no load ,on load , phasor diagrams, 'V' curves, hunting, method of starting . Lectures-10, Marks -20

UNIT –V

Induction Motors: Three phase motors - principle of operation, construction, slip, torque equation , torque slip characteristics, relation between slip and rotor copper loss and rotor input, equivalent circuit, different types of starters, applications induction motors.

Single phase Induction motors - principle of operation, types, and applications.

Special purpose machines: Principle, working and application of stepper motor, servo motor, universal motors. Lectures-10, Marks -20

REFERENCES:

1. Edward Hughes : Electrical technology, ELBS.6/e
2. V. N. Mittal : Basic electrical engineering, TMH. 2/e
3. Nagarath and Kothari : Electrical machine, TMH.2/e
4. S.K. Bhattacharya : Electrical machine, TMH. 2/e
5. V. Del Toro : Electrical machines and power systems, Pearson.

LIST OF EXPERIMENTS:-

1. Two Wattmeter method of power measurement in three phase balanced load.
2. Speed control of D.C. shunt motor by armature voltage and flux control method,.
3. Load test on D.C. shunt motor
4. Load test on D.C. series motor.
5. O.C. and S.C. test of single phase transformer to determine regulation and efficiency.
6. Scott connection to convert three phase supply to two phase supply.
7. Regulation of alternator by synchronous impedance method.
8. Regulation of alternator by direct loading method.
9. To plot 'V' curve and P.F. curve for synchronous motor.
10. Load test on three phase induction motor.
11. Study of various single phase motors.
12. Study of three point starter.

The term work should include minimum EIGHT experiments , from the list..

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W.E.F 2006 -2007
TERM - I
SEMICONDUCTOR DEVICES AND CIRCUITS

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 4 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 50 Marks

UNIT - I

Semiconductor physics and semiconductor diodes: Conduction mechanism in extrinsic semiconductors, carrier concentrations, mobility, drift and diffusion current densities, mass action law, Einstein's relation and charge density relation. Piecewise linear diode model, V - I characteristics equation, static and dynamic resistances of diode, small signal and large signal model of diode.

Diode applications and special types of diodes: FWR, capacitor filter, power, shottkey and PIN diode, diode switching times and junction capacitance. Lectures-10, Marks -20

UNIT - II

BJT biasing and small signal models: Need for biasing BJT circuit, voltage divider biasing , stability factors, thermal runaway and compensation circuits. Low frequency h - parameter analysis , derivations for CE configuration for A_i, R_i, R_o, A_{vs}, A_{is} (exact / approx. analysis) in terms of h - parameters, Miller theorem and its dual, CE – CC and CE – CB parameter conversion, comparison of performance parameters with CB and CC configurations in tabular form. Need for multistage amplifiers. Cascade analysis of CE – CE, CE – CC and CE – CB. Darlington configuration, boot strapping.

. Lectures-10, Marks -20

UNIT - III

Field effect transistors : An overview of different types of FET's viz JFET , MOSFET, MESFET, JFET : JFET construction, symbol, basic operation , V - I characteristics, transfer characteristics, cut-off and pinch off voltages, trans conductance , Input resistance and capacitance, Drain to source resistance, Universal JFET bias curve. Biasing arrangements for JFET , biasing against device variation , biasing for zero current drift, d.c.analysis using graphical approach. JFET as voltage controlled source JFET amplifiers :CS, CD, CG amplifiers, their analysis using small signal JFET model.

Lectures-10, Marks -20

UNIT - IV

MOSFET's: An overview of following MOSFET's types – DMOSFET, EMOSFET, Power MOSFET nMOSFET, pMOSFET and CMOS devices .handling precautions for CMOS devices, D and E MOSFET characteristics and parameters, non ideal voltage current characteristics finite output resistance , body effect subthreshold conductions , break down effects and temperature effects , MOSFET biasing ,introduction to MOSFET as VLSI device.

MOSFET in VLSI: V - I characteristic equation in W / L ratio , MOSFET capacitances , CMOS inverter static characteristic , noise margin, threshold voltage

Lectures-10, Marks -20

UNIT - V

Frequency responses for BJT and FET: Concept of frequency response , human ear response to audio frequencies ,significance of octaves and decades .The decibel unit ,square wave testing of amplifiers. Effect of coupling, bypass and junction capacitances on frequency response for BJT and FET amplifiers. Concept of dominant pole, N stage cascade amplifier, band pass of cascaded stages, concept of gain band width product.

Lectures-10, Marks -20

REFERENCES:

1) Thomas L Floyd : Electonics devices , Pearson 6/e
2) Millman Halkias: Integrated electronics ,TMH publications
3) Boylested Nashelsky: Electronics devices and circuits, ,Pearson LPE 8/e
4) Donald A, Neamen : Semiconductor physics and Devices – Basic Principles, TMH. 3/e
5) Cathey and Singh : Electronics Devices and circuits , TMH 3/e
6) D.R.Cheraku , B.T.Krshina : Electronics Devices and circuits, Pearson
7) R.S.Sedha : Applied Electronics , S Chand Publication.

LIST OF EXPERIMENTS:-

1) For a half wave rectifier with capacitor filter find line and load regulation and ripple factor.
2) For a bridge rectifier with capacitor filter find line and load regulation and ripple factor.
3) For full wave rectifier with capacitor filter find line and load regulation and ripple factor.
4) Determine h-parameters for CE configuration.
5) Determine I/P and O/P impedances and voltage gain of a CE stage followed by CC.
6) Measurement of I/P and O/P impedances and voltage gain of Darlington circuit without and with bootstrapping.
7) Plot characteristics of CSFET. Determine amplification factor, transconductance and dynamic resistance.
8) Determine I/P and O/P impedances and voltage gain and current gain for CSFET.
9) Plot characteristics of CSDMOSFET.
10) Plot characteristics of CSEMOSFET.
11) Square wave testing of an amplifier used to find lower and higher cut off frequency.
12) For two cascaded CE-CE stages, find voltage gain and bandwidth.
13) For cascode amplifier determine voltage gain and bandwidth.
14) Study frequency response of CSFET.
15) Study the effect of bypass capacitor on frequency response of single stage CE amplifier

The term work should include a minimum TWELVE experiments from the list.

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E.(ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 –2007
TERM - I

ELECTRONICS WORKSHOP

Teaching scheme:
Practical : 2 hrs/week

Examination scheme:
Term Work : 25 Marks

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I.] Multimeters and Power supply

(a) Study of Analog and Digital Multimeter (DMM)

1) To study AC / DC voltage and current ranges, different ranges for resistance and other functions.
2) Comparison of DMM and True RMS meters.
3) Difference in V_{rms}, V_{dc} and $V_{average}$ voltages.
4) Importance of $3_{1/2}$ digit and $4_{1/2}$ digit multimeters.
5) Study of different types of fuses used for multimeter.
6) Different types of batteries used in multimeters, voltage and current ratings.

(b) Study of Power Supply

1) Single Power Supply
2) Dual Power Supply
3) Dual Tracking Power Supply
4) Variable AC Power Supply

Measurement of voltage and current levels at different ranges

II.] Study of Cathode Ray Oscilloscope (C.R.O.)

a) Function of front panel knobs, different types of screens used for C.R.O.and probes.
b) Measurement of various parameters e.g. AC,DC voltages , currents, time , frequency measurement lissageous pattern and by phase shift method
c) Study of different types of C.R.O.

III.] Study of signal generator.

a) Study of front panel of signal generator.
b) Adjusting different signals (sine, square, triangular) along with voltages and frequencies
c) Significance of source resistance, offset voltage

IV.] Study of passive components

a) Resistors
   1) Different types:- MFR, MFR precision, CFR, Wire-wound, Variable resistors, potentiometers, trimpots of different wattages e.g. 1/8, ¼, ½ ,1 watt.
   2) 3, 4, 5 band resistors and colour codes of resistors.
   3) Fixed resistors
   4) Importance of zero ohm resistance
   5) E-series alpha numeric resistance like E6, E12, E24 resistors.

b) Capacitors

Different types of capacitors (Fixed and Variables)

1) Fixed : - ceramic, tantalum, aluminium, polysterene, mica, metalised poly paper, electrolytic etc.
2) Variables: - air-dielectric, trimmer, ganged capacitors. Voltage and capacitance ratings
3) Calculation of capacitance like 101, 102, 103,104 etc on ceramic capacitors.
4) Identification polarities of electrolytic capacitors.
5) Testing of polarized capacitors using analog meters [$\geq 1\mu f$].
6) Checking of capacitors on meters and identification of open / short of capacitance.
7) Colour coding of capacitors.

c) Inductors: -

Different types : ferrite core, iron core, RF coil, power transformer (step-down) , pulse transformer.

Study of quality factor.

V.] Study of hardware components

a) Wires and cables: different types like single strand, multi strand, ribbon cable, co-axial cable (75 ohm), TV antenna cable (300 ohm).
b) Switches: SPDT, DPDT, Toggle, Rotary, Micro, Membranes, Sliding.
c) Relays: general purpose, reed, pcb mounting, body mounting.
d) Wire connectors: relimate, power connector, D - type, FRC

VI.] Study of Active components

Diodes, Transistors, FET / MOSFET

a) Study of different types of diodes: rectifier, switching, power diode, number identification using datasheets.
Frequency operation of switching diodes, zener diodes, LED, LCD.
Testing of diodes (by multimeters).
b) Transistors: (BJT / FET)
Study of different types of transistors e.g. Audio, semi-power, power with their numbers, company names, Xerox of data sheet.
Identification of the types of transistors (NPN, PNP)
Different packages of transistors.
Testing of BJT (Using DMM).
Testing of FET (Using DMM).

VII.] a) Build and test any basic electronic circuit on bread board .
b) Preparation of artwork and layout of above circuit . Preparation of its PCB and testing the circuit.

REFERENCES:

1. James and M. Krickpatrick : Electronic Drafting and PCB Design , Thomson publications.
2. W. C. Bosshart : Printed Circuit Boards Design And Technology, TMH
3. Motorola power data book

Note: The term work is based on above syllabus with minimum EIGHT experiments and experiment from part VII is compulsory

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E.(ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 –2007
TERM - II
MANAGEMENT SCIENCE

Teaching scheme:
Lectures : 4 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)

UNIT - I

History of management, Scientific management and its principles, Administration management, Neo-Classical theory

Therbligs, Modern Management theories, Relation between Administration, Management and Organization, Levels of Management

Functions of Management Lectures-10, Marks -20

UNIT - II

Organizational structures- Line, Functional, Line and staff, Forms of Business Ownership-Proprietorship, Partnership, Joint Stock company-Private limited. company, Public limited. company , Co-operative organizations, Public sector, Joint Ventures their meanings ,formation, advantages, limitations and applications.

Lectures-10, Marks -20

UNIT - III

Engineering Economics, Wants,Utility,Demand,Supply, Elasticity of demand and supply, Capital-Fixed capital, Working Capital

Sources of finance-Shares, Debentures, Ploughing Back of Capital, Loans from Banks, Trade Credit, Public Deposits, Financial- Institutions, Foreign Capital

Cost Estimating, Cost Accounting, Fixed Costs, Variable Costs, Selling Price (No Numerical)

Lectures-10, Marks -20

UNIT - IV

Manpower Planning, Factors affecting Manpower Planning, Sources of Recruitment, Need, Objectives and Benefits of Training Methods of training Workers, Supervisors and Executives Job Evaluation and Merit Rating (concept only)

Selling and Marketing Concept, Sales Promotion, Advertising

Lectures-10, Marks -20

UNIT - V

Industrial Acts:

Factories Act, Industrial Accidents, Industrial Safety, Quality Concepts, Total Quality Management, ISO 9001-2000, Intellectual Property Rights - Patents, Trademarks, Copy Rights

Lectures-10, Marks -20

REFERENCES:

1. M.Mahajan : Industrial Organization and Production Management, Dhanpat Rai and compony
2. O.P Khanna : Industrial Engineering and Management, Dhanpat Rai and compony
3. Koontz :Essentials of Management, TMH 6/e.

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S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - II

ELECTRONICS CIRCUITS AND APPLICATIONS

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 4 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 50 Marks

UNIT - I

Diode Application:Voltage Multiplier Circuits: Working and comparison of voltage doubler, tripler and voltage quardrupler configuration. Limitations of voltage multiplier circuits. **Clipping and Clamping circuits:** Series and parallel form of clipping circuits, biased clipper, their operation and transfer characteristics, clamping circuits.

Differential Amplifiers: Emitter coupled differential amplifier, FET differential amplifier.D.C. Analysis of BJT and FET differential amplifier, Common Mode Rejection Ratio, methods used to improve CMRR. Schmitt Trigger circuit.

Lectures-10, Marks -20

UNIT - II

High Frequency, small signal BJT amplifiers: Behaviour of transistor at higher frequency, high frequency hybrid "π" CE amplifier model. CE short circuits current gain for π models. Definitions and derivations for f_α, f_β and f_γ.Technique to improve bandwidth; cascode amplifiers.

Single tuned, doubled tuned and staggered tuned amplifiers, calculation of unloaded and loaded Q, effect of staggering on bandwidth [No derivations], neutralization

Lectures-10, Marks -20

UNIT - III

Large Signal AF BJT Amplifiers: Classes of power amplifiers: Class A, Class B, Class AB. An overview and applications of Class C and Class D amplifiers. Class A with resistive load, transformer coupled Class A amplifier, Class B push-pull, Class AB, complimentary symmetry, and quasi complimentary configuration.

Efficiency and power dissipation analysis for Class A transformed coupled and Class B push pull amplifiers. Comparison of efficiency of other configuration, distortion in amplifiers, concept of total harmonic distortion. Lectures-10, Marks -20

UNIT IV

Feedback Amplifiers and Oscillators: Concept of feedback, negative and positive feedback, classification of feedback amplifiers based on feedback topology [voltage, current, transconductance and transresistance amplifiers]. Advantages and Disadvantages of negative feedback. Effect of feedback on input and output impedances and bandwidth of an amplifiers. Analysis of circuit for each feedback topology.

Oscillators: Barkhausen Criterion, study of following oscillators circuits (using BJT / FET) .LC Oscillators : General form of LC Oscillators, Hartley Oscillator, Colpitts Oscillators, Clapp Oscillators, Crystal Oscillators.

Lectures-10, Marks -20

UNIT - V

Voltage Regulators and Voltage References:

Block diagram of regulated power supply, series regulator, line and load regulation, output resistance Analysis of emitter follower regulator and controlled feedback type regulator. I.C. voltage regulator [IC 723]. Method for boosting output current using external series pass transistor.Protection circuits for regulator, over current protection, simple and fold back current limiting. Three terminals floating, dual and adjustable regulators. Current Boosting (LM 340, LM 320, 78XX, 74XX series) SMPS, UPS [Block Diagram and working only].

Lectures-10, Marks -20

REFERENCES:

1) Salivahanan, Kumar and Vallavraj : Electronics Device and circuits , TMH
2) Millman and Halkias: Integrated Electronics ,TMH
3) Allen Mottershead : Electronics Devices and Circuits Introduction , PHI
4) Boylestad Nashelsky : Electronics Devices and circuits, Pearson 9/e
5) Malvino : Electronics Principles , TMH

LIST OF EXPERIMENTS:

1. Emitter Coupled Differential Amplifiers Calculation of CMRR using emitter resistance.
2. In experiment 1 , emitter resistance is replace by (Constant current source) find CMRR
3. Plot frequency response of single tuned amplifiers.
4. Measure the response of Schmitt trigger circuit for a sine wave input observe Hysteresis characteristics, calculation of UTP, LTP.
5. Line and Load regulation of a series regulator.
6. Plot frequency response of voltage series / voltage shunt feedback amplifiers calculation of bandwidth with and without feedback.
7. Class A transformer coupled efficiency calculation.
8. Class B push pull amplifiers efficiency calculation.
9. Study of oscillators circuits L C oscillators, Hartley, Clapp/Colpitts.(Any two)
10. Determination of frequency and output voltage of crystal oscillator.
11. Effect of feedback on Ri, Ro and Av for voltage series / current series feedback amplifier.
12. Plot frequency response of stagger tuned amplifiers.
13. Complementary symmetry power amplifier, calculation of efficiency.
14. To observe and elimination of crossover distortion in complimentary symmetry class B amplifier.
15. IC LM317 for fixed out put, adjustable output ¤t regulation.
16. Low and High voltage measurement and regulation characteristics using LM723.
17. Regulation characteristics of voltage doubler circuit
18. Q point, Ad, Ac and CMRR measurement for BJT differential amplifier

The term work should include a minimum TWELVE experiments from the list.

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - II
ENGINEERING MATHEMATICS – III

Teaching Scheme:	Examination Scheme:
Lectures : 4 Hrs/Week	Theory Paper : 100 Marks (3 Hours)
Tutorials : 1 Hr/Week	Term Work : 25 Marks

Unit – I : Linear Differential Equations

Linear Differential equation of order n, Solution of LDE with constant coefficient, method of variation of parameters, equations reducible to linear form with constant coefficients, Cauchy's linear equation, Legendre's linear equation.Solution of Simultaneous and Symmetric Simultaneous Differential equation Applications to electrical circuts. Lectures-10, Marks -20

Unit – II : Complex Variables

Functions of complex variables, Analytic functions, C-R equations, Conformal mapping, Billinear transformation, Residue theorem, Cauchy's Integral theorem and Cauchy's Integral formula (without proof). . Lectures-10, Marks -20

Unit – III : Fourier and Z – Transforms

Fourier Transform (FT): Fourier Intergral theorem. Sine and Cosine Integrals. Fourier ,Transform, Fourier Cosine Transform, Fourier Sine Transform and their inverses.,Problems on Wave equation.

Z Transform (ZT): Definition, standard properties (without proof), ZT of standard sequences and Inverse. Solution of simple difference equations, Applications of Z Transform to discrete system analysis.

. Lectures-10, Marks -20

Unit –IV: Laplace Transform (LT)

Definition of LT, Inverse LT. Properties and theorems. LT of standard functions. LT of some special functions viz, error, 1st order Bessel's Periodic, Unit Step, Unit Impulse and Ramp. Problems on finding LT and Inverse LT. Initial and final value theorems.Applications of LT for Network Analysis.

Lectures-10, Marks -20

Unit – V Vector Integration.

a) Applications of partial differential equations to :

1. Vibration of strings or wave equations:

$$\frac{\partial^2 y}{\partial t^2} = a^2 \frac{\partial^2 y}{\partial x^2}$$

2. One dimensional heat flow equation.

$$\frac{\partial u}{\partial t} = a^2 \frac{\partial^2 u}{\partial x^2}$$

3. Laplace equation Two dimensional heat flow equation.

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$$

by separating variables only.

b) Line Integral, Surface and Volume integrals, Gauss's, Stoke's and Green's Theorems (without proof). Applications to problems in Electromagnetic Fields. Lectures-10, Marks -20

REFERENCES:

1. Erwin Kreyszig :Advanced Engineering Mathematics , John Wiley and sons
2. H.K. Dass : Advanced Engineering Mathematics , S. Chand
3. Wylie C.R. and Barrett : Advanced Engineering Mathematics , Mc Graw Hill
4. B.S. Grewal : Higher Engineering Mathematics , Khanna Publication, Delhi.
5. B.V. Raman : Engineering Mathematics , Tata Mc- Graw – Hill.
6. P.N. Wartikar and J.N. Wartikar : Applied Mathematics (Volume I and II), Pune Vidhyarthi Griha Prakashan, Pune
7. Thomas L. Harman James Dabney and Norman Richer : Advance Engineering Mathematics with MATLAB, Books/Cole, Thomson Learning 2/e
8. Dr. Gokhale, Dr. Chaudhari and Dr. Singh :Engineering Mathematics – III

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - II
NETWORKS AND LINES

Teaching scheme:	Examination scheme:
Lectures : 4 hrs/week	Theory Paper : 100 Marks (3 Hours)
Tutorial : 1 hrs/week	Term Work : 25 Marks
Practical : 2 hrs/week	Practical : 25 Marks

UNIT – I

A.C. circuits and theorems – Mesh and nodal analysis, Thevenins , Nortons, Millmans, Reciprocity, and Maximum power transfer theorem.(A.C. analysis)

Graph theory and network equations – Introduction, graph, tree, co-tree and loops. Incidence matrix, cutset matrix, tieset matrix and loop currents, number of possible trees of a graph, analysis of networks, network equilibrium equations. duality general network transformation.

Lectures-10, Marks -20

UNIT – II

Resonance – Introduction , Q- factor, series resonance, selectivity and bandwidth, selectivity with variable capacitance and variable inductance, Parallel resonance, selectivity and bandwidth, Maximum impedance condition with C, L and f variable, current in antiresonance, General case resonance.

Transfer and mutual inductance, Coupling coefficient, properties of ideal transformer, impedance matching with transformer, "L" and "T" circuit impedance matching.

Lectures-10, Marks -20

UNIT – III

Four Terminal Network and Transmission Line- Two port network classification, characteristic impedance and propagation constant for symmetrical network , image and iterative impedance for asymmetrical network, Terminal impedances, reduction of complicated network into its equivalent T and π networks.

Transmission line as two port network, cascaded sections, characteristic impedance and propagation constant. Transmission line general solution, infinite line, wavelength and velocity of propagation. Line without distortion, reflection on transmission line reflection coefficient and SWR.

Lectures-10, Marks -20

UNIT – IV

Filters and attenuators – Filter fundamentals, constant k type low pass and high pass filter, m derived filter , low pass and high pass m - derived filters, Band pass and band stop filters, half section , terminating half section, composite filter.

Attenuators - symmetrical T and π attenuators, ladder type attenuators, asymmetrical T and π attenuators. Lectures-10, Marks -20

UNIT – V

Transient response – Standard input signals, first order transients, zero input response, step response, pulse response, switched dc transients, switched ac transients, second order natural response, second order circuit equations, over damped, under damped and critically damped response, second order transients, initial conditions.

Lectures-10, Marks -20

REFERENCES:-

1) D Roy Choudhary : Networks and Systems, New Age International
2) Carlson : Circuits, Thomson publications,
3) John D. Ryder : Network Lines and Fields, Prentice Hall of India, 2/e
4) M. E. Van-Valkenburg : Network Analysis, Prentice Hall of India.

LIST OF EXPERIMENTS:-

1) Verification of Thevenins and Nortons theorem for a two port reactive network.
2) Maximum Power Transfer theorem.
3) Series and parallel resonance- BW and Q factor
4) Frequency response of constant k filters and find out cut of frequency.
5) Frequency response of m derived filters and find out cut of frequency.
6) Frequency response of band pass filter
7) Design build and test symmetrical T or Π attenuator(plot attenuation Vs RL)
8) Measurement of Zo and γ for a transmission line.
9) To study the transient response of second order circuit
10) Measurement of VSWR and effect of terminating impedance on VSWR for a transmission line and evaluation of reflection coefficient.

The term work should include a minimum EIGHT experiments from the list including at least one experiment from each unit.

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 –2007
TERM - II

ANALOG COMMUNICATION

Teaching scheme:
Lectures : 4 hrs/week
Practicals : 2 hrs/week

Examination scheme:
Theory Paper : 100 Marks (3 Hours)
Term Work : 25 Marks
Practical : 50 Marks

UNIT – I

Introduction and importance of communication system: Modulation, Need for modulation, types of modulation, Noise : Internal sources of noise , external sources of noise, signal to noise ratio, noise figure , noise factor due to amplifiers in cascade , measurement of noise temperature and noise factor , Noise in reactive circuit, transit time noise, addition of noise due to several sources .

Lectures-10, Marks -20.

UNIT – II

Amplitude modulation concept : Introduction, modulation index, frequency spectrum of AM wave, power and current calculation in AM, AM generation circuits low level and high level modulation, block diagram of AM transmitter , single side band techniques, balance modulation circuits. SSB generation methods. (Filter method, phase shift, third method,) extension of SSB pilot carrier system, ISB system, VSB system. Lectures-10, Marks -20

UNIT – III

Angle modulation concept: Introduction, modulation index, frequency spectrum of FM wave, phase modulation, comparison between PM and FM, FM modulator circuits, (direct method, basic reactance modulator, stabilizes reactance modulator, varactor diode modulator, indirect method.) pre-emphasis, de-emphasis, narrow band and wide band FM. Lectures-10, Marks -20

UNIT – IV

AM / FM receiver : TRF receiver, super heterodyne receiver block diagram of AM and FM receiver, characteristics of receiver , (sensitivity , selectivity , fidelity, image rejection ratio, tracking), mixer stage , mixer circuits, AM detectors, AGC types , Muting circuits, Pilot carrier receiver, suppressed carrier receiver, ISB receiver, FM demodulator, Amplitude limiter , slope detector, balance slope detector, phase discriminator , ratio detector .

Lectures-10, Marks -20

UNIT – V

Types of communication channels: transmission lines, parallel wire, coaxial cable, submarine cable, wave guide, optical fiber cable.

Multiplexing: TDM, FDM, concept of radiation, electromagnetic spectrum, mechanism of propagation, ground wave, sky wave, space wave, duct, tropospheric, concept of fading and diversity reception

Introduction to TV system and introduction to telephone system.(Primary treatment only)

Lectures-10, Marks -20

REFERENCES:

1. George Kannedy and Bemard Davis : Electronics Communication System, Tata McGraw Hill.4/e
2. Robort Schoenbeck : Electronics Communication , PHI, 2/e
3. Dennis Roddy and John Coolen : Electronics Communication, Prentic-Hall of India. 3/e
4. Wayne Tomasi : Electronic Communication system, Pearson LPE 5/e
5. Taub and Schilling : Principle of communication, Tata McGraw Hill.
6. T.G.Thomas, S.Chandrashekhar : Communication theory, TMH.

LIST OF EXPERIMENTS:

1) Study of AM transmitter and calculate of modulation index of AM wave by envelope method.
2) Study of Diode detector circuit.
3) Study of FM transmitter.
4) Study of Amplitude limiter circuit.
5) Calculate gain for RF / IF stage with AGC and without AGC.
6) To plot frequency response curve for IF Amplifier.
7) Study of Phase discriminator.
8) Study of AM super heterodyne receiver.
9) Study of FM receiver.
10) Study of AM Mixer circuit. / balanced Modulator circuit.
11) Study of TV system.
12) Study of Telephone system.

The term work should include a minimum EIGHT experiments from the list.

NORTH MAHARASHTRA UNIVERSITY JALGAON
S.E. (ELECTRONICS, ELECTRONICS & COMMUNICATION, ELECTRONICS & TELECOMMUNICATION)
W.E.F 2006 -2007
TERM - II
SOFTWARE APPLICATION – I

Teaching scheme: **Practical : 2 hrs/week**

Examination scheme: **Term Work : 25 Marks**

Objectives:
To make the students aware of:
1. Programming practice in C for numerical methods .
2. Use of application specific software tools in the design development simulation and testing of electronic circuits .
3. Use of mathematical software packages for understanding and modeling electrical signals and linear systems .

Section- A : Numerical computational techniques:
Instruction of following techniques assited by C programme/ function implimentation of at least THREE of them is expected .
Solution of transcendental and polynomial equation, bisection method,Newton Raphson ,secant, successive methods, solution of linear equations using Gauss elimination .Gauss-Jordan methods Newton's forward and backward difference equations, interpolation, numerical integration and differentiation: trapezoidal rule Simpson's 1/3 and 3/8 rule, Euler's Method.

List of suggested assignments:
1: Program to solve numerical methods : bisection method, Newton Raphson method using users defined functions. Functions should incorporate parameter passing techniques.
2. Program using Functions to solve differential equations by Euler's modified method.
3. Program using Function to find integration by Simpson's 1/3 and 3/8 method.

Section B: Simulation of typical circuits using circuit simulation tools
(a) Transistorized circuits.
  (1) Two stage amplifiers.
  (2) Series regulatator.
  (3) Audio Driver / Audio power Amplifiers.
(b) IC Based circuits
  (1) Sequential Digital circuits.
  (2) Combinational Logic
  (3) Timer Circuit

Section C : Simulation software based Experiments / Assignments:
Assignments related to Electronics Instrumentation, Digital circuits and logics design, Analog communication, Network and lines.

REFERENCES:
W H Hayt / J E Kemmerly / S M Durbin : Engineering circuit Analysis, TMH 6/e

Note: Term work should be based on minimum SIX assignments, THREE from section A and ONE each from section B (a), B (b) and C.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
STRUCTURE OF TEACHING AND EVALUATION

S.E. (ELECTRONICS, ELECTRONICS AND COMMUNICATION / ELECTRONICS AND TELECOMMUNICATION)
FIRST TERM

W.E.F. 2006-07

SR. No.	Subject	Teaching Scheme Hours/ week			Examination Scheme				
		Lecture	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	Electronics Materials and Components	4	-	-	3	100	25	-	-
2	Electronics Instrumentation	4	-	2	3	100	25	25	-
3	Digital Circuits and Logic Design	4	-	2	3	100	25	25	-
4	Electrical Circuits and Machines	4	-	2	3	100	25	-	-
5	Semiconductor Devices and Circuits	4	-	4	3	100	25	50	-
6	Electronics Workshop	-	-	2	-		25	-	-
	Total	**20**	**-**	**12**	**-**	**500**	**150**	**100**	**-**
	Grand Total	**32**			**750**				

SECOND TERM

SR. No.	Subject	Teaching Scheme Hours/ week			Examination Scheme				
		Lectures	Tutorial	Practical	Paper Duration Hours	Paper	TW	PR	OR
1	Management Science	4	-	-	3	100	-	-	-
2	Electronics Circuits and Applications	4	-	4	3	100	25	50	-
3	Engineering Mathematics-III	4	1	-	3	100	25	-	-
4	Networks and Lines	4	1	2	3	100	25	25	-
5	Analog Communication	4	-	2	3	100	25	50	-
6	Software Application - I	-	-	2	-		25	-	-
	Total	**20**	**2**	**10**	**-**	**500**	**125**	**125**	**-**
	Grand Total	**32**			**750**				