

DEC 301 DIGITAL ELECTRONICS

2L+1T+0P+2.5C

MM100

MODULE-I LOGIC FAMILIES: DTL-, TTL-, ECL-, MOS- families and their characteristics; circuit details, analysis, and loading rules. Number System: Decimal, Binary, Octal, and Hexadecimal systems, Binary Arithmetic, BCD and Gray code. Boolean algebra and the Demorgan's Theorems.

MODULE-II LOGIC GATES: BUFFER, NOT, AND, OR, NAND, NAND, NOR, X-OR, and X-NOR gates, Combinational Logic Circuits: SOP and POS forms, reduction and inter conversion of forms, logic design using K maps.

MODULE-III ADDER & SUBTRACT OR CIRCUITS: Half adder, full adder, half subtract or, full subtract or, design of all these circuits using discrete gates. Flip-Flops: RS flip-flop, J-K, D-, T-flip-flops; Racing problem and the Master-Slave, J-K Flip-flop.

MODULE-IV SEQUENTIAL LOGIC CIRCUITS: Design of asynchronous and synchronous up/down counters, Shift Registers: SIPO, SISO, PIPO, and PISO register Multiplexers and de-multiplexers; of 4:1, Basic idea of decoders and encoders.

MODULE-V ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERTERS: Basic terms and definitions, Conversion methods: ADC and DAC, type of convertors: integrated type, Ramp type, Successive approximation methods.

Project work

A project work will be assigned to students by the subject faculty. It will be of 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty and students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text / Reference Books:

- 1.Digital Principles and Applications, Malvino & Leach, Tata McGraw Hill
- 2.Digital Electronics, Signov & Donovan, Delmar Thomson Learning.
- 3.Op-Amps and Linear Integrated Circuits, Gayakwad R.A., Prentice Hall of India,
- 4.Digital Electronics, Taub & Schilling, Tata McGraw Hill
- 5.Electronics Analog and Digital, Nagrath, Prentice Hall of India Ltd.
- 6.Modern Digital Electronics, Jain R.P., Tata McGraw Hill.
- 7.Digital Systems, Ronald J.Tocci &. Neal S. Widmer, Pearson Education.

SEMESTER III

Diploma Electronics & Communication Engineering

DEC 302 ELECTRONIC DEVICES AND CIRCUITS

3L+0T+0P+3C

MM100

MODULE-I P-N JUNCTION: Basic introduction of P-N junction Diode, Half wave Rectifier, Full wave rectifier, bridge type rectifier, ripple factor, efficiency of a rectifier etc. L, C, LC- and Pi-filters, ripple factor in each

MODULE-II TRANSISTOR CIRCUITS: Concept of transistors, V-I characteristics of transistor in CB, CC, and CE configuration design of voltage amplifiers: Regions of operation, Load line analysis of transistor amplifier, hybrid parameter model, Design procedure of Direct coupled R-C coupled and transformer coupled amplifier .

MODULE-III REGULATED POWER SUPPLY: Need of voltage regulation, Regulated Power Supplies: Simple zener voltage regulator, transistorized series and shunt regulators; Design of regulated power supplies using voltage regulator IC`s like: 78XX and, 79XX series, Introduction of 'SMPS' and UPS.

MODULE-IV FEEDBACK AND OSCILLATORS: Basic concept of feedback, merits and demerits of negative feedback, series and shunt feedback circuits, Design of RC and LC oscillators. Multi-vibrators, Power amplifiers: class A, and class B amplifier.

MODULE-V SPECIAL DEVICES: Construction Operation equivalent circuits and characteristics of JFET, MOSFET, CMOS, and Semiconductors photo devices: LED, LDR, Photo transistor and LCD Varactor Diode

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Text/ Reference Books:

1. Electronic Devices and Circuits, Millman J. et al Tata McGraw Hill, 2007.
2. Electronic Devices and Circuits, Boylestad R.L. And Louis Nashelsky, Prentice Hall, 2006.
3. Electronic Devices and Circuits, Bogart T.F. Jr., J.S.Beasley and G.Rico, Pearson Education , 2004.
4. Principles of Electronic Circuits, Burns S.G. and P.R.Bond, Galgotia Publications, 1998.
5. Microelectronics, Millman and Grabel, Tata McGraw Hill, 1988.
6. Electronic Devices and Circuits, Dr. K. Lal Kishore, B.S. Publications, 2005.
7. Electronic Devices and Circuits, Prof GS N Raju, I K International Publishing House Pvt. Ltd.

DEE 301 ELECTRICAL MACHINES

3L+0T+0P+3C

MM100

MODULE-I INTRODUCTION: Introduction of Electrical Machines, Classification of Electrical machines , Basic principle.

DC GENERATOR: Introduction of DC machines, basic principle, construction, types of DC generator, EMF equation, LAP and WAVE winding, introduction of armature reaction and commutation, application

MODULE-II DC MOTOR: Working principle, back e.m.f., types of D.C. motor and elementary idea of their characteristics, torque equation, methods of speed control (Description only). Starting of D.C. Machines

MODULE-III INDUCTION MOTORS: Introduction of AC machines, Principle of operation and constructional of induction motors, types, starting and running torque, torque- slip characteristic, no load and block rotor test, losses and efficiency, application of induction motor,

SINGLE PHASE INDUCTION MOTOR: Introduction, types and construction of single phase induction motor, application of single phase induction motor.

MODULE-IV SYNCHRONOUS MACHINES: Introduction, construction, advantages of rotating field, types of rotor, emf equation, excitation system, comparison between induction machine and synchronous machines, working and application of synchronous generator (Alternator), principle of synchronous motor, working and application of synchronous motor.

MODULE-V TRANSFORMERS: Operating principle, E.M.F equation, ideal transformer, types, equivalent circuit, no load and short circuit test, efficiency, all day efficiency, back to back (Sumpner's test), phasor diagram, application

POLYPHASE TRANSFORMER: construction, various connection and groups, introduction of auto transformer, potential and current transformer.

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Text/ Reference Books:

- 1.Asfaq Hussain "Basic Electrical Engineering", Dhanpat Rai
- 2.Nagrath I.J., Basic Electrical Engineering, Tata McGraw Hill.
- 3.A.E. Fitzgerald, D.E., Higginbotham and A. Grabel, Basic Electrical Engineering, McGra Hill.
- 4.H. Cotton, Advanced Electrical Technology, Wheeler Publishing.

DEE 302 ELECTRICAL CIRCUIT THEORY

2L+1T+0P+2.5C

MM100

MODULE-I INTRODUCTION: Active and Passive, Linear and Non-linear, Unilateral and Bilateral, Lumped and Distributed elements and networks, Ideal and practical, Voltage and current sources, Dependent and independent sources, sources conversion techniques,

MODULE-II NETWORK THEOREMS: Node and Mesh analysis, Star delta transformation. Superposition, Thevenin's, Norton's, Reciprocity, Telligon's and Maximum power transfer theorems.

MODULE-III A.C.THEORY: Representation of sinusoidal quantities by phasor's, Physical explanation of the phase relationship between voltage and current when sinusoidal alternating voltage is applied across:- (a) Pure resistance, (b) Pure inductance and, (c) Pure capacitance. General Circuit Relations: Three Phase Star, Three Phase Delta, Star and Delta Combination, Basic introduction of the Low pass and High Pass filters

MODULE-IV-POWER RELATIONS IN AC CIRCUITS: Instantaneous Power in AC Circuits, Power Factor, Apparent Power, Reactive Power, Power Triangle, Complex Power.

MODULE-V TWO PORT NETWORK: Two port network, T-network, π network, Impedance parameter, Admittance parameter, ABCD (Transmission) parameter, hybrid parameter, inverse hybrid parameters, Series-parallel inter connections, Inter conversion, Image impedance, Image transfer constant

Project work

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Text/ Reference Books

1. Network Analysis, Van Valkenbury, Prentice Hall of India, New Delhi.
2. Network Filters and Transmission Lines, AK Chakarvorty, Dhanpat Rai & Co. Publication, New Delhi.
3. Network Lines and Fields, John D Ryder, Prentice Hall of India, New Delhi.
4. Network Analysis, Soni and Gupta, Dhanpat Rai & Co. Publication, New Delhi.

SEMESTER III

Diploma Electronics & Communication Engineering

ENG 108 TECHNICAL COMMUNICATION

2L+0T+0P+2C

MM100

MODULE-I FUNCTIONAL GRAMMAR: Active, Passive voice, Conditional Sentences, Syntax, Concord, and Common Errors.

Practical (Oral): To make students practice the above mentioned grammatical rules in the practical classes.

MODULE-II COMMUNICATION:- Meaning & Importance of communication, Process of communication, Language as a tool of communication.

Practical (Oral): To make students speak on their understanding of communication

MODULE-III WRITING SKILLS: Reporting events, writing newspaper reports, Bio-data making, writing of Resumes, and writing job application.

Practical (Oral): To make students practice writing on the above mentioned processes.

MODULE-IV LISTENING SKILLS: The listening process, hearing & listening, types of listening, Barriers to listening.

Practical (Oral): To make student develop the skills of listening & thus improve their speaking skills.

MODULE V: PROJECT WRITING: Project writing for sponsoring agencies. Research paper and data sheet preparation and communication for publication. Preparing analysis report

Text/ Reference Books:

1. Technical Communication Principles & Practices, Raman Meenakshi & Sharma Sangeeta, ONP, N. Delhi
2. Wren & Martin: High School English Grammar & Composition- S.Chand & Co. N.Delhi

DEC 303 DIGITAL ELECTRONICS LAB

0L-0T-4P-2C

M.M.100

LIST OF PRACTICALS:

1. Verify truth tables of various basic logic functions.
2. Verify truth tables of various universal logic functions.
3. Design and verify the truth table of Half Adder
4. Design and verify the truth table of Full Adder
5. Design and verify the truth table of Half Subtractor
6. Design and verify the truth table of Full Subtractor
7. Design 4:1 Multiplexer
8. Design 1:4 Demultiplexer
9. Design 4:1 Encoder
10. Design 1:4 Decoder.
11. To study various types of flip-flop
12. To study various types of counters

DEC 304 ELECTRONIC DEVICES & CIRCUIT LAB

0L+0T+4P+2C

MM100

LIST OF EXPERIMENT

1. Design of unregulated power supply using half wave rectifier
2. Design of unregulated power supply using Full wave rectifier
3. Design of regulated power supply using Shunt regulator
4. Design of regulated power supply using series regulator
5. Study and design a D.C amplifier
6. Study and design an A.C amplifier
7. Study and design a two stage amplifier
8. To generate square-wave using a multi-vibrator and to observe the wave form on a CRO.
9. To observe Triggering and working of a bi-stable circuit and observe its output wave form on a CRO.
10. To observe Triggering and working of a multi-vibrator circuit and observe its output wave form on a CRO.

DEE 303 ELECTRICAL MACHINES LAB

0L+0T+4P+2C

MM100

List of Experiments:-

1. To verify that in an A.C. circuit, the phasor sum (not the algebraic sum) of currents at any junction is zero.
2. To find the voltage-current relationship in a R-L series circuit and to measure power and power factor of the circuit.
3. To find for a filament lamp:-
 - (a) Variation of resistance with temperature.
 - (b) Variation of temperature with voltage.
 - (c) Variation of resistance with voltage.
 - (d) Variation of power with voltage.
4. To measure power and power factor in three phase system by two wattmeter method.
5. To determine the efficiency and regulation of a transformer by performing direct loading.
6. To measure the induced emf of separately excited D.C. generator as a function of field current.
7. To measure the terminal voltage of a separately excited D.C. generator as a function of load current.
8. To measure the terminal voltage of a D.C. shunt generator as a function of load current.
9. To measure the speed of a separately excited D.C. motor as a function of load torque at rated armature voltage.
10. To observe the difference in the starting current at switching on single phase capacitor start induction motor with:-
 - (a) The capacitor disconnected and
 - (b) The capacitor connected.Also to determine how to reverse the direction of rotation.
11. To start a Three Phase induction motor and to determine its slip at various loads.
12. To determine V-curves of a synchronous motor.

DEE 304 : ELECTRICAL CIRCUIT LAB

0L+0T+4P+2C

MM100

LIST OF EXPERIMENTS

1. Verification of principle of superposition theorems with dc sources.
2. Verification of Norton theorems in DC circuits
3. Verification of Maximum power transfer theorems for DC network
4. Determination of transient response of current in RL Circuits.
5. Determination of transient response of current in RC Circuits.
6. Determination of transient response of current in RLC circuit.
7. Determination of z and h parameters (dc only) for a two port network.
8. To measure the characteristic impedance of symmetrical T and π networks
9. To measure the image impedance of a given asymmetrical T and π networks
10. For a prototype low pass filter:
 - a) Determine the characteristic impedance experimentally
 - b) Plot the attenuation characteristic

SEMESTER III

Diploma Electronics & Communication Engineering

ENG 112 ADVANCE SOFT SKILLS

0L-0T-2P-1C

M.M-100

MODULE I: What is Personality? Personality Traits & Grooming

MODULE II: Importance of Attire, Table Manners

MODULE III: General Etiquettes- (a) Talking to Elders/ Younger ones/ Peer/ Stranger

(b) Treating Gender Discrimination

MODULE IV Behaviourology- With Parents/ Relations/ Neighbors

MODULE V Use of Language - (a) Spoken- At phone/ General Conversation

(b) Written- E- mails/ other electronic media

Text/Reference Books

1. Business communication Design, Angell, Pamela, Mcgraw-Hill, New York.
2. Grammar Finder, Eastwood, John, Oxford university press.
3. Effective technical communication, Mitra, K. Barun, Oxford university press.
4. Communicate to conquer: A handbook of group discussion and interviews, PHI learning, New Delhi.

DEE 402 : ELECTRICAL & ELECTRONICS MEASUREMENT AND INSTRUMENTATION

2L+1T+0P+2.5C

MM100

MODULE-1 CLASSIFICATION OF MEASURING INSTRUMENTS: Indicating, recording and integrating instruments, Accuracy and sensitivity, Types of errors, Deflecting, controlling and damping torque, Construction, working principle and operation of PMMC, ammeter and voltmeter.

MODULE-2 WATT-METERS AND ENERGY METERS: Construction, operation and working principles, Dynamometer type wattmeter, Induction type wattmeter, Blondels theorem and measurement of power by two wattmeter method in 3-phase circuits, Single phase and three phase induction type energy meter, Testing of single phase induction type energy meter by direct and phantom loading.

MODULE-3 MEASUREMENT OF RESISTANCE: Classification of resistance, Measurement of low resistance by Kelvin's double bridge, Measurement of medium resistance by Ammeter and Voltmeter, Whetstone's bridge, Measurement of high resistance and insulation resistance, Megger Earth tester and Ohmmeter

MODULE-4 POTENTIOMETERS AND DISPLAY: Types of A.C. and D.C. potentiometers-Construction, Standardisation, Applications, CRO, Function Generator, DSO

MODULE-5 A.C. BRIDGES: General equation for bridge balance, Maxwell's inductance bridge, Maxwell's inductance capacitance bridge, Anderson's bridge, Schering Bridge, Wein's bridge for frequency measurements

Text/ Reference Books:

1. Electrical Measurement & Instrumentation A.K.Sawhney, Dhanpat Rai Publications
2. Electrical Measurement & Instruments, J.B.Gupta, Katson & Sons Publications
3. Measurement and Instrumentation Principle, Alan Morris, Butter Worth Publications
4. Electrical Measurement D.R.Nagpal, Standard Publishers Distributors

DEC 401 PRINCIPLES OF COMMUNICATION ENGINEERING

3L-0T-0P-3C

M.M.100

MODULE I INTRODUCTION: Need for modulation, frequency translation and demodulation in communication systems, Basic scheme of a modern communication system. Amplitude modulation Derivation of expression for an amplitude modulated wave. Carrier and side band components. Modulation index. Spectrum and BW of AM Wave. Relative power distribution in carrier and side bands. Elementary idea of DSB-SC, SSB-SC, ISB and VSB modulations, their comparison, and areas of applications.

MODULE II FREQUENCY MODULATION: Expression for frequency modulated wave and its frequency spectrum, Modulation index, maximum frequency deviation and deviation ratio, BW and FM signals, Carson's rule. Effect of noise on FM carrier. Need for pre-emphasis and de-emphasis, capture effect. Comparison of FM and AM in communication systems, Phase modulation Derivation of expression for phase modulated wave, modulation index, comparison with frequency modulation.

MODULE III PRINCIPLES OF MODULATORS: Square Law Modulator, Switching Modulator, Collector modulator, Base Modulator, Balanced Modulator, Ring Modulator, Principles of FM Modulators Working principles and applications of reactance modulator, varactor diode modulator, VCO and Armstrong phase modulator. Stabilization of carrier for using AFC Block diagram approach, Foster-Seeley discriminator, Ratio detector, Phase locked Loop (PLL) FM demodulators.

MODULE IV PULSE MODULATION: Sampling theorem and elementary idea of sampling frequency for pulse modulation, time division multiplexing (TDM) and frequency division multiplexing (FDM), Pulse code modulation (PCM), Basic scheme of PCM

MODULE V RADIO RECEIVERS: Various type receivers, Receivers characteristic and their applications, electronic Tuning system, AM demodulator, FM demodulator, Block diagram of super-heterodyne receiver

PROJECT WORK

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Text/ Reference books:

1. Kennedy, Electronics Communication, Tata McGraw Hill, New Delhi
2. Lathi B.P., Modern Analog & Digital Communication Systems, Oxford University Press.
3. Singh R.P. & S.D. Sapre, Communication System Analog and Digital, Tata McGraw Hill

DEE 404 INDUSTRIAL ELECTRONICS

2L-0T-0P-2C

M.M.100

MODULE I THYRISTORS AND THEIR APPLICATIONS: Name, symbol and typical applications of members of thyristors family. SCR, Triac & Diac-Basic structure, operation, V-I characteristics and ratings, gate circuits, triggering process and triggering circuits, turn off methods and circuits, selections of heat sinks, mounting of thyristor on heat sinks, basic idea of protection of thyristor circuits. UJT-Operation, V-I characteristics, equivalent circuit

MODULE II APPLICATION OF SCR: SCR, Diac and Triac switching circuits like automatic battery charger, voltage regulator, emergency light, alarm circuits, time delay relay circuits and circuits for over current and over voltage protection. A.C. phase control using SCRs and Triacs, variable speed drives using DC motors and small AC machines.

MODULE III RECTIFIERS: OPERATION of three Phase Bridge controlled rectifier and its applications. Principles of operation of basic inverter circuits, basic series and parallel commutated inverters, principle of operation of cyclo-converter, choppers and dual converter, mention of applications.

MODULE IV INDUCTION AND DIELECTRIC HEATING: Introduction, importance of heating in industry, Principle of induction heating, Industrial applications of induction heating, Principle of dielectric heating, Industrial applications of dielectric heating.

MODULE V TRANSDUCER: Classification of transducer Primary transducer Secondary transducers Active transducer Passive transducer Analog transducer Digital transducer Construction, principle of operation and application of the following transducers : Potentiometer LVDT and RVDT. Resistance strain gauge factor, gauge materials, temperature compensation, thermocouple, Thermister, RTD, Photo cell, Piezo Electric, Capacitive PH electrode.

Project work

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Text/ Reference Books

- 1.Power Electronics Circuits, Devices & Application, M. H. Rashid, P.H.I
- 2.Power Electronics: Principle and Application, J. Michael Jacob, Viks Publishing House Pvt. Ltd.
- 3.Optoelectronics an Introduction to Materials and Devices, Singh Jasprit , McGraw-Hill
- 4.Instrumentation Devices & Systems, C. S. Ranjan, Tata McGraw Hill.

DCS 402 COMPUTER PROGRAMMING IN C

2L-1T-0P-2.5C

M.M. 100

Module I:

Elements of C: character set, key words, Data types, Constants and Variables, Operators: unary, binary, ternary, Operator precedence, flowcharts. Control statement- if statement, if-else statement, conditional operator, switch control statement, for loop, while loop, do-while loop, the break and continue keyword.

Module II:

Array Introduction: Basic concepts, Memory representation, one dimensional array, Two dimensional array, Three dimensional array.

Module III:

Functions- Basic Concepts, Declaration and prototypes, Calling, Arguments, and Scope rules, recursion, Storage classes types, Library of functions: math, string, system.

Module IV:

Pointers- Basic concepts, operators, Pointer expression: assignment, arithmetic, comparison, Dynamic memory allocation, Pointer v/s Arrays, Array of pointers, Pointer v/s Functions.

Module V:

Structure- Basic concepts, Declaration and memory map, Elements of structures, Structure v/s array, Structure v/s function, Union, Enumerated data types: typedef, enum, Self - referential structures, Low level Bitwise Operators.

Text/Reference Books:

- 1.Let us C,Yashwant Kanetkar,BPB
- 2.Programming with C,Schaum's Series, TMH
- 3.C ProgrammingE.Balaguru Swami,TMH

**DEE 406 ELECTRICAL & ELECTRONICS MEASUREMENT AND
INSTRUMENTATION LAB**

0L-0T-4P-2C

M.M 100

LIST OF EXPERIMENTS:

1. Study of constructional features and calibration of moving iron and moving coil type ammeter and voltmeter.
2. Study of constructional features and calibration of dynamometer type wattmeter and induction type energy meter.
3. Measurement of power in 3-phase circuits by two wattmeter method
4. Testing of single-phase induction type energy meter by direct Method
5. Measurement of resistance by Kelvin's double bridge
6. Measurement of resistance by Whetstone bridge
7. Study of the constructional details and working of Megger and measurement of insulation resistance.
8. Measurement of Earth's resistance by Earth tester
9. Calibration of ammeter and voltmeter by D.C. potentiometer
10. Measurement of inductance and capacitance with the help of a suitable A.C. Bridge

DEC 402 PRINCIPLES OF COMMUNICATION ENGINEERING LAB

0L-0T-4P-2C

M.M.100

LIST OF EXPERIMENTS:

1. a) To observe an AM wave on CRO produced by a standard signal generator using internal and external modulation
b) To measure the modulation index of the wave obtained in above practicals.
2. a) To obtain an AM wave from a square law modulator circuit and observe its waveforms
b) To generate a DSB-SC signal and observe the pattern on CRO for different levels of modulating signal
3. To obtain an AM wave from reactance tube modulator/voltage controlled oscillator circuit and measure the frequency deviation for different modulating signals.
4. To obtain modulating signal from an AM detector circuit and observe the pattern for different RC time constants and obtain its optimum value for least distortion.
5. To observe the sampled signal and compare it with the analog input signal. Note the effect of varying the sampling pulse width and frequency on the sampled output.
6. To verify the sampling theorem
7. To observe and note the pulse modulated signals (PAM, PPM, PWM) and compare them with the corresponding analog input signal
8. To measure the Quantisation noise in a 3 bit/4 bit coded PCM signal
9. To feed an analog signal to a PCM modulator and compare the demodulated signal with the analog input. Also note the effect of low pass filter at the demodulated output.
10. To study the process of delta modulation/demodulation
11. Perform AM demodulation
12. Study the FM demodulation

MGT 110 GENERAL APTITUDE

0L-0T-2P-1C

M.M.100

MODULE 1 Number System: Number Series, HCF and LCM of Numbers, Fractions and Decimals, Square Root and Cube Roots, Indices and Surds, Simplification and Approximation,

MODULE 2 Problems on Ages and Numbers Percentage, Profit, Loss and Discount, Average, Ratio and Proportion, Time, Work and Wages, Pipes and Cisterns, Simple Interest, Compound Interest,

MODULE 3 Growth and Depreciation, Time and Distance, Trains, Boats and Streams, Races, Clocks, Calendar

MODULE 4 Area of Plane Figures, Volume and Surface Area of Solid Figures Elementary Algebra, Linear Equations, Quadratic Equations and In-equation, Progression,

MODULE 5 Permutation and Combination, Probability, Geometry, Trigonometry, Data Interpretation, Data Sufficiency

Text/Reference Books:

1. R. S. Agarwal- Aptitude Mathematics
2. Mathuria- Quicker Mathematics

SEMESTER IV

Diploma Electronics & Communication Engineering

DCS 406 COMPUTER PROGRAMMING USING C LAB

0L-0T-4P-2C

M.M. 100

Write Programming Codes in C on Following Topics

1. WAP in C to calculate Factorial of a number by using function
2. WAP in C to swap two numbers by using function
3. WAP in C to read and display array elements
4. WAP in C to read an array and display the sum of its elements
5. WAP in C to add two 3x3 matrix
6. WAP in C to multiply 3x3 matrix
7. WAP in C to calculate the length of the given string.
8. WAP in C to read information about 10 books and display them
9. WAP in C to read a file and display its contents

DEE 407 : INDUSTRIAL ELECTRONICS LAB

0L+0T+4P+2C

MM100

LIST OF EXPERIMENT

1. Identification of various types of packages and terminals of various low and high Power thyristors (SCR and Triac)
2. To determine and plot firing characteristics of SCR:-
 - (a) By varying the anode to cathode voltage.
 - (b) By varying the gate current.
3. Observing voltage wave shapes at various points of UJT relaxation oscillator circuit.
4. Observation of wave shapes at relevant points of the circuit of a single phase controlled rectifier using SCR and UJT relaxation oscillator.
5. To determine the firing characteristics of Triac in different mode i.e. Mode-I (plus), Mode-I (minus), Mode-III (plus), Mode-III (minus).
6. Observe the wave shapes and measure AC and DC voltage at various points of a three phase bridge rectifier circuit.
7. Observe the wave shapes and measure AC and DC voltage at various points of a three phase SCR controlled bridge rectifier circuit.
8. Test an AC phase control circuit using Triac and observe wave shapes and voltages at relevant points in circuit (while using for lamp intensity control and/or AC fan speed control).
9. To study the working of a single phase SCR/ transistor inverter circuit by observing wave shapes at input and output.
10. To measure force and pressure by using strain gauge transducer.

DEE 504 CONTROL SYSTEM

3L-0T-0P-3C

M.M.100

MODULE I INTRODUCTION: Need of automatic control, Concept of open loop and closed loop control, Block diagram of feedback control system and its basic elements, relative advantages and disadvantages of open loop and closed loop control system, definition and explanation of given control system: Linear and Non-Linear Systems, Continuous and discrete Systems, Static and Dynamic Systems, Single Input Single Output (SISO) System and Multi-input Multi-output (MIMO) System.

MODULE II COMPONENTS & DEVICES USED IN CONTROL SYSTEM : Brief description and working of potentiometer, self balancing potentiometer, differential transformer, synchros, servomotors, tacho generators, saturable core reactor and magnetic amplifier.

MODULE III INPUT AND OUTPUT RELATIONSHIP OF SYSTEM & CONTROL SYSTEM COMPONENTS: Concept of transfer function and its use in control system, Derivation of transfer function of given systems: Simple RC low pass network, Lag, Lead, Lag-Lead compensating networks, DC servomotor and DC Tacho generator, derivation of transfer function by block reduction technique and signal flow graph.

MODULE IV PERFORMANCE OF CONTROL SYSTEM: Step, Ramp, Pulse and sinusoidal type of inputs and their Laplace Transforms, Definitions of Rise time, Peak overshoot, Settling time, Natural frequency and Damping Ratio pertaining to second order system, Initial value and final value theorems and their use in control systems, Types of feedback systems and error constants.

MODULE V STABILITY CRITERION : Bounded Input and Bounded Output (BIBO) System, Concept of Stability, stability criteria, different techniques of determining stability e.g. Routh, Nyquist criteria, bode plot and their applications to simple system. Electric Controller: On-OFF controller, Proportional, Proportional plus integral (PI), Proportional plus integral plus derivative (PID).

PROJECT WORK:

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Text Books:

1. Norman S. Mise "Control System Engineering", Wiley Publishing Co.
2. M.Gopal, "Control System; Principle and design", Tata McGraw Hill.
3. M.Gopal, "Modern Control system", Tata McGraw Hill.
4. D.RoyChoudhary, "Modern Control Engineering", Prentice Hall of India.

Reference Books:

1. I.J. Nagrath and M. Gopal -Control Systems Engineering, 3rd Ed., New Age Publication
2. K. Atsuhiko Ogata: Modern Control Engineering, PHI

DEC 501 NETWORK FILTERS AND TRANSMISSION LINES

2L-1T-0P-2.5C

M.M.100

MODULE I NETWORKS : Two port (four terminals) network, Symmetrical and asymmetrical networks: Balanced and unbalanced network; T-network, π network, Ladder network; Lattice network; L-network and Bridge T-network, Symmetrical Network:, Asymmetrical Network, Concept and significance of iterative impedance, image impedance, image transfer constant and insertion loss. The half section (L-section); symmetrical T and π sections into half sections.

MODULE II ATTENUATORS: Modules of attenuation (Decibels and Napers): General characteristics of Attenuators, Analysis and design of simple attenuator of following types; Symmetrical T and π type, L type.

MODULE III FILTERS: Brief idea of the use of filter networks in different communication systems, concept of low pass, high pass, band pass and band stop filters. Basic ideas of Butterworth, Chebychev filters. Prototype Filter Section, Impedance characteristics Vs frequency characteristics of a low and high pass filter and their significance, Attenuation Vs frequency; Phase shift Vs frequency, characteristics impedance Vs frequency of T and π filters and their significance, Simple design problems of prototype low pass section. M-Derived Filter Sections Limitation of prototype filters, need of m-derived filters Active Filters, Basic concept of active filters and their comparison with passive filters.

MODULE IV TRANSMISSION LINES: Transmission Lines, their types and applications. Distributed constants, T and π representation of transmission line section. Definition of characteristic impedance, propagation constant, attenuation constant and phase shift constant. Concept of infinite line, Condition for minimum distortion and minimum attenuation of signal on-the-line and introduction to loading methods. Concept of reflection and standing waves.

MODULE V VSWR: definition of reflection coefficient, SWR & VSWR and their relation (no derivation). Transmission line equation, expression for voltage, current and impedance at a point on the line, Concept of transmission lines at high frequencies. Introduction to stubs. (Single, open and short stubs).

PROJECT WORK:

A project work will be assigned to students by the subject faculty. It will be of 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty and students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Book:

1. Van Valkenburg, Network Analysis, Prentice Hall of India, New Delhi.
2. AK Chakarvorty, Network Filters and Transmission Lines, Dhanpat Rai & Co. Publication

DEE 502 ELECTRICAL INSTALLATION AND MAINTENANCE

3L-0T-0P-3C

M.M.100

MODULE-I INSTALLATION, MAINTENANCE OF ELECTRICAL MACHINE/EQUIPMENT:

Standard procedure for installation of various electrical machines such as Transformer (I.S 1886: 1967), Rotating electrical m/c (I.S.900-1965) as well as electrical wiring (I.S.2274: 1963) and switchgear (I.S.3072:1975), Inspection on arrival and before installation. Storage preparation for installation, foundation preparation. Tools/Instruments required for installation. Safety precautions to be observed. Installation procedure for electrical machine/ equipment. Preparation of technical report & specification sheet. Basic need of maintenance. Meaning of preventive maintenance. Importance and advantages of preventive maintenance. Maintenance schedules of different types of electrical machines(rotating and static) and equipment. Maintenance of transmission lines, circuit-breaker and cables. Break down maintenance and its record keeping. Safety rules applicable for preventive maintenance and breakdown maintenance.

MODULE-II INSTALLATION & MAINTENANCE OF DOMESTIC APPLIANCES:

Common faults in domestic appliances. Installation procedure for domestic appliances, Maintenance procedure for domestic appliances. Tools/equipment required for maintenance of domestic appliances. Safety rules observed while maintenance of domestic appliances.

MODULE-III EARTHING: Necessity of earthing, system of earthing, Equipment for earthing, Methods of earthing, Earth electrodes, Earth bus & Earth wire. Measurement of earth resistance. Values of earth resistance of different equipment/installation. Reduction of earth resistance. Earthing procedure, Installations in building - Domestic fitting & appliances- Industrial premises. - Substation & Generating station. Overhead power lines.

MODULE-IV CABLES AND CABLING: Cable laying methods, Cable jointing and termination, Definition of trouble shooting. Causes of faults and types of faults. Common faults in domestic appliances and other machine equipment. Common faults in electrical installation and cable. Trouble shooting charts for above electrical equipment and machines. Tools and equipment used in trouble shooting. Remedial measures to be taken for faults in electrical machines and equipment.

MODULE-V ELECTRICAL ACCIDENTS AND SAFETY: Types and causes of electrical accidents. Factors affecting severity of electric shock. Preventive measures against electrical accident. General and specific safety rules to avoid electrical accident as per I.E. acts. Importance of "permit to work" in power station. Safety tools and devices with their applications like slogan, Board, Notice, Fire extinguisher etc.

Text/Reference Books:

1. Electrical installation, Maintenance and fault location work book TTTI-Bhopal, Somaiya publication
2. Electrical Installation, Estimating and costing- S.L. Uppal, Khanna Publisher
3. Operation and maintenance of electrical equipment-B. V. Rao, Asia Publication
4. Electrical maintenance and repairs-J.I. Watts- Mc millar, London,
5. Troubles in electrical equipment-N.E. Stafford- Mc Graw. Hill

DEC 502 OPTICAL FIBER COMMUNICATION

2L-0T-0P-2C

M.M.100

MODULE I INTRODUCTION: Historical perspective, basic communication systems, optical frequency range, advantages optical fiber communication, application of fiber optic communication.

MODULE II LIGHT WAVE FUNDAMENTALS: Nature of light, acceptance angle and numerical aperture, electromagnetic waves, dielectric wave guide, modes in planar guide, dispersion and distortion in wave guide.

MODULE III OPTICAL FIBER WAVEGUIDES : Fiber structure, step-index fiber, graded - index fiber, attenuation, modes in step, index and graded index fibers, pulse dispersion and information rate in optical fibers, construction of optical fibers, optical fiber cables.

MODULE IV LIGHT SOURCES: Light emitting diodes (LEDs), Operating characteristics of LEDs, Laser principles, different types of lasers, laser diodes, operating characteristics of laser-diodes, distributed feedback laser diode, optical amplifier, fiber laser. Light Detectors: Principles of photodetection, photomultiplier semiconductor photodiode, PIN diode and Avalanche Photo Diode (APD), comparison. Between PIN diode and APD.

MODULE V OPTICAL FIBER JOINTS: : Fiber, alignment and joint loss, fiber end preparation, splices, connectors, source coupling. Distribution Networks and Fiber Components: Distribution network, directional couplers, star couplers, switches, fiber optical isolators, attenuators, wave length division multiplexing.

PROJECT WORK

A project work will be assigned to students by the subject faculty. It will be of 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty and students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

TEXT BOOKS:

1. Joseph. C. Palais, Optical Fiber Communication, Pearson Education Publications, Published by Addison Wesley Longman (Singapore) Pte. Ltd., Delhi.
2. Gupta S.C., Optical Fiber Communication and its Applications, Prentice Hall India - New Delhi.
3. Agrawal G.P., Fiber-Optic Communication Systems, John Wiley and Sons, New Delhi.
4. John M. Senior, Optical Fibers Communication, Prentice Hall India, New Delhi.
5. Gower J., Optical Communication Systems, Prentice Hall India, New Delhi.

REFERENCE BOOKS:

1. Gerd Keiser, Optical Fiber Communication, Mc Graw Hill, International Editions.
2. Franz & J.H., Optical Communication: Components and Systems, Narosa Publishing House Pvt. Ltd. Darya Ganj New Delhi.

DEC 503 DIGITAL COMMUNICATION

2L-1T-0P-2.5C

M.M.100

MODULE I INTRODUCTION TO COMMUNICATION SYSTEM: Evaluation of telecommunication system, definition of source, destination, subscriber, calling and called link, switching system, Type of automatic telephone exchange, electronic telephone hand set, Block diagram of cordless phone system, Brief idea of EPABX

MODULE II CARRIER TELEPHONY: Features of carrier telephone system; conception of frequency division multiplexing; hybrid coils; frequency allocation and formation of groups; schematic diagram and working of 3 channel and 12 channel carrier systems. Carrier and pilot frequency generation.

MODULE III DIGITAL COMMUNICATION SYSTEM: Pulse code modulation- Sampling, Quantization, Encoding, Decoding, PCM Transmission formats and systems, Basic of digital multiplexing. Brief idea of multiplexing hierarchy. FSK, PSK, QAM, Demodulation, Error control (Detection and correction **MICROWAVE COMMUNICATION:** - Basic features of microwave communication, Block diagram and explanation of microwave system.

MODULE IV SATELLITE COMMUNICATION: Brief idea of RF uplink and down link, Multiplexing and modulation, Block diagram and brief explanation of satellite communication system.

MODULE V MOBILE COMMUNICATION: Radio pager, Cellular telephony system - Brief history cellular structure and planning, Frequency allocation, Propagation problem. Types of mobile system- Analog and Digital cellular radio. Architecture of GSM network, GSM services.

PROJECT WORK:

There will be a project work assigned to students by the subject faculty. It will be of 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty and students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

TEXT BOOKS:

1. Roody, Dennis and Coolen, John- Electronic Communications- 4thEdition-PHI
2. Kennedy, George and Davis, Bernard- Electronic Communication System- 4th Edition- Tata Mcgraw Hill.

REFERENCE BOOKS:

1. Haykin, Simon - Communication System - 4th Edition- John Wiley.
2. Tanenbaum, Andrew S. - Computer Network- 3rd Edition-PHI

DEE 508 CONTROL SYSTEM LAB

0L-0T-4P-2C

M.M.100

LIST OF EXPERIMENTS:

1. To determine response of first order and second order systems for step input for various values of constant 'K' using linear simulator Module and compare theoretical and practical results.
2. To study P, PI and PID temperature controller for an oven and compare their performance.
3. To study and calibrate temperature using resistance temperature detector (RTD)
4. To design Lag, Lead and Lag-Lead compensators using Bode plot.
5. To study DC position control system
6. To study synchro-transmitter and receiver and obtain output V/S input characteristics
7. To determine speed-torque characteristics of an AC servomotor.
8. To study performance of servo voltage stabilizer at various loads using load bank.
9. To study behaviour of separately excited DC motor in open loop and closed loop conditions at various loads.
10. To study PID Controller for simulation proves like transportation lag.

DEC 504 NETWORK FILTERS AND TRANSMISSION LINES LAB

0L-0T-4P-2C

M.M.100

LIST OF EXPERIMENTS:

1. To measure the characteristic impedance of symmetrical T and π networks
2. To measure the image impedance of a given asymmetrical T and π networks
3. For a prototype low pass filter:
 - a) Determine the characteristic impedance experimentally
 - b) Plot the attenuation characteristic
4. To design and measure the attenuation of a symmetrical T/ π type attenuator
5. For a prototype high pass filter:
 - a) Determine the characteristic impedance experimentally
 - b) To plot the attenuation characteristic
6.
 - a) To plot the Impedance characteristic of a prototype band-pass filter
 - b) To plot the attenuation characteristic of a prototype band pass filter
7.
 - a) To plot the impedance characteristic of m- derived low pass filter
 - b) To plot the attenuation characteristics of m-derived high pass filter
8. To observe the information of standing waves on a transmission line and measurement of SWR and characteristic impedance of the line
9. Draw the attenuation characteristics of a crystal filter

DEE 506 ELECTRICAL INSTALLATION AND MAINTENANCE LAB

0L-0T-4P-2C

M.M.100

LABORATORY EXPERIMENTS:

1. Prepare a foundation for installation of electrical machines (rotating & static)
2. Install a small static/ rotating electrical m/c /equipment and prepare its report.
3. Measure Insulation Resistance of a winding/ cables/ wiring installation and write the procedure.
4. Measure earth resistance of installation in building/ domestic fitting & appliances etc. and reduce the same, if necessary through appropriate method and prepare its report.
5. Perform various tests applied to an insulating oil.
6. Prepare plate/ pipe earthings as per I.S. and measure the earth resistance.
7. Install a cable in your premises by direct laying method.
8. Trouble shooting of an induction motor.
9. Dismantle and trouble shoot of ceiling fan.
10. Use of following,
 - (a) Bearing puller tools
 - (b) Filler gauge
 - (c) Different types of spanners
 - (d) Cork screw driver
11. Use of following instruments
 - (a) Megger
 - (b) Clip on meter
 - (c) Multimeter
 - (d) Stroboscope
 - (e) Earth tester
 - (f) Phase sequence indicator
 - (g) Growlar
12. Locate cable fault using cable fault locator/cable testing equipment.
13. Read and interpret I.E. rules pertaining to safety.

DEC 505 DIGITAL COMMUNICATION LAB

0L-0T-4P-2C

M.M.100

LIST OF EXPERIMENTS:

1. Study of FAX machines and its working.
2. To study the parts of telephone hand set:
 - (a) Frequency response of telephone receiver.
 - (b) To observe the wave form of impulses by dialing a number.
3. Visit and study of Digital Switching System.
4. Visit and study of Microwave transmission system.
5. Visit and study of Satellite transmission system.
6. Demonstration of sampling, FSK and PSK by simple experiment.
7. Study of working of mobile phones and its services.

DEC 506 PROJECT WORK AND INDUSTRIAL TRAINING

0L-0T-4P-2C

M.M.100

Students will attend Industrial training of four to six weeks in any industry or reputed organization after the IV semester examination in summer vacation. The evaluation of this training shall be included in the V semester evaluation.

The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the IV semester and shall be the nodal officer for coordination of the training.

Students will also be required to prepare an exhaustive technical report of the training during the V semester which will be duly signed by the officer under whom training was taken in the industry/organization. The covering format shall be signed by the concerned office in-charge of the training in the industry. The officer-in-charge of the trainee would also give his rating of the student in the standard University format in a sealed envelope to the Principal of the Polytechnic.

The student at the end of the V semester will present his report about the training before a committee constituted by the Principal of the Polytechnic which would be comprised of at least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Principal. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately in a sealed envelope to the Principal. The marks by the external examiner would be based on the report submitted by the student which shall be evaluated by the external examiner and cross examination done of the student concerned.

Not more than three students would form a group for such industrial training/ project submission.

DEC 507 CAMPUS RECRUIDMENT TRAINING –I (TECHNICAL)

0L-0T-2P-1C

M.M.100

As a part of the curriculum, the Campus Recruitment Training (Technical) forms an important component of education for Diploma student. It is an attempt to bridge the gap between conventional study and competitive exam study or campus placement. The Program, which would be a help in government jobs as well as top private companies. In the process, it provides training for the students to improve their technical skill as per requirement. This program benefits the student to understand what he/she has studied in the class room and what is being practiced in competitive exam for government and private jobs.

In this program technical preparation according to competitive exam being done in the field of Electronics & Communication. Major technical subjects Electronics Circuit & Devices, Communication System, Microwave System, Antenna Design, Radar System, Digital Signal Processing, Information Theory & Coding, Digital Electronics, Electronic Measurements: measurement of resistance, Inductance and Capacitance, Potentiometer, DC and AC bridges, Moving coil, Moving Iron, Dynamometer, Induction type meter, measurement of Power, Energy and Frequency, Transducers are covered in stage. The program mainly focus on multiple choice question which help students for their preparation.

DEC 601 MICROWAVE ENGINEERING

2L-1T-0P-2.5C

M.M.100

MODULE 1 WAVE GUIDES AND COMPONENTS: Introduction of Microwaves and their applications. Rectangular Waveguides, Solution of Wave equation in TE and TM modes. Power transmission and Power losses. Excitation of modes in Rectangular waveguides, circular waveguides: Basic idea of TE and TM modes, field patterns, TEM mode of propagation. Scattering matrix representation of networks. Rectangular cavity and circular cavity resonators. Waveguide Tees, Magic Tees. Hybrid rings. Waveguide corners, Bends and twists. Directional couplers, Circulators and isolators.

MODULE 2 KLYSTRONS: Limitation of conventional vacuum tubes, Construction and operation of two cavity & multicavity klystrons. Velocity modulation and electron bunching (analytical treatment), Applegate diagram and applications of two cavity klystrons. Construction, working and operation of Reflex klystron. Applications and practical considerations. Velocity modulation, power output and frequency characteristics of a Reflex klystron. Electron admittance.

MODULE 3 TRAVELLING WAVE TUBES (TWT): Construction, operation and practical consideration of helix type TWT. Introduction to CW power, pulsed dual mode TWT. Coupled cavity TWT. Applications of TWT.

MAGNETRON - Types of Magnetron. Construction, operation, analysis and practical consideration of cavity or travelling wave magnetron. Introduction to coaxial, frequency angle and voltage tunable magnetrons. Backward cross field oscillator, Forward wave cross field amplifier.

MODULE 4 MICROWAVE MEASUREMENTS: Detection of microwaves, Microwave power measurement, Impedance measurement, Measurement of scattering parameters, Frequency measurement, VSWR measurements. Introduction to microstrip lines, Parallel striplines, Coplanar striplines, Shielded striplines, Slot lines, Integrated Fin line, Non-radiative guide, Transitions, Bends and Discontinuities

MODULE 5 MICROWAVE NETWORK ANALYSIS: Impedance and Admittance matrices, Scattering matrix, Reciprocal networks and Loss less networks parameters, ABCD Matrix, Equivalent circuits for Two port Network, Conversions between two port network Signal flow graphs, Discontinuities in waveguides and microstrip.

MICROWAVE SEMICONDUCTOR DEVICES - Construction, Operation and Practical applications of PIN diode, varactor and Tunnel diode, Gunn diode, IMPATT, TRAPTT diodes, BJT, JFET, MESFET, CCD, MASER and LASER.

Text/Reference Books:

1. Foundations For Microwave Engineering – R.E. Collin, R.E. Collin, Wiley
2. Microwave Engineering By, Pozar, Wiley
3. Fundamental of Microwave Engineering, Anoop Singh Poonia & Seema Verma, PHI Learning Private Limited, New Delhi
4. Microwave Engineering, Annapurna Das, Sisir Das, TMH
5. Microwave Devices And Circuits, 3, Samuel Y. Liao, Pearson

DEC 602 DIGITAL SIGNAL PROCESSING

3L-0T-0P-3C

M.M.100

MODULE 1: REALIZATION OF DIGITAL SYSTEMS- Introduction, direct form realization of IIR systems, cascade realization of an IIR systems, parallel form realization of an IIR systems, Ladder structures: continued fraction expansion of $H(z)$, example of continued fraction, realization of a ladder structure, example of a ladder realization.

MODULE 2: DESIGN OF INFINITE IMPULSE RESPONSE DIGITAL FILTERS- Introduction to Filters, Impulse Invariant Transformation, Bi-Linear Transformation, All- Pole Analog Filters: Butterworth and Chebyshev Design of Digital Butterworth and Chebyshev Filters.

MODULE 3: FINITE IMPULSE RESPONSE FILTER DESIGN- Windowing and the Rectangular Window, Other Commonly Used Windows, Examples of Filter Designs Using Windows ,The Kaiser Window.

MODULE 4: DISCRETE FOURIER TRANSFORM- Definitions, Properties of the DFT, Circular Convolution, Linear Convolution.

MODULE 5: FAST FOURIER TRANSFORM ALGORITHMS- Introduction, Decimation in Time (DIT) Algorithm, Computational Efficiency, Decimation in Frequency(DIF) Algorithm Application of DSP to Speech and Radar signal processing.

Text/Reference Books:

1. Digital Signal Processing, Sanjit K Mitra, TMH
2. Digital Signal Processing, S.Salivahanan A Vallavaraj, C.Gnanapriya, TMH
3. Digital Signal Processing: Principals, Algorithms And Applications, John G.Proakis, Dimitris G Manolakis, PHI
4. Digital Signal Processing, A.V. Oppenheim And R.W. Schaffer, PHI
5. Digital Signal Processing, Thomas J. Cavicchi, John Wiley & Sons
6. Digital Signal Processing, Emmanuel Ifeachor, Barry Jervis, Pearson
7. Digital Signal Processing, Chi-Tsong Chen, Oxford
8. Digital Signal Processing, Engelberg, Shlomo, Springer
9. Digital Signal Processing For Measurement , D Antona, Gabriele, New Age International

DEE 602 ELECTRONIC & ELECTRICAL DESIGNS AND DRAWING

2L-1T-0P-2.5C

M.M.100

MODULE 1: TRANSFORMER DESIGN AND PANEL WIRING DIAGRAM FOR THE USUAL PROTECTIVE DEVICES: Single phase and three-phase core type distribution transformer Single phase shell type transformer Output equation Main dimension of frame Core design and winding design

Panel Wiring Diagram: Synchronization and parallel operation of 3-phase alternators A.C. 3-phase squirrel cage induction motor. A.C. 3-phase slip ring induction motor. Parallel operation of three phase transformers D.C. compound generator Parallel operation of D.C. compound generators

MODULE 2: DESIGN OF WINDING: Definition of Single and double layer winding Full pitch and short pitch winding Integral and fractional winding Developed winding diagrams of single phase and three-phase induction motors Developed winding diagrams of alternators

MODULE 3: D.C. MACHINE DESIGN: Choice of specific magnetic and specific electric loading Output equation Armature Design) Calculation of main dimensions Output coefficients Choice of number of poles Design of shunt field winding

MODULE 4: 3-PHASE INDUCTION MOTOR DESIGN: Choice of specific magnetic and specific electric loading Output equations Calculation of main dimensions Relation between D and L Effect of length of air gap on motor performance Calculation of no load current

MODULE 5: SIMPLE ALARM AND SIGNAL CIRCUITS: Using contactors, designing and drawing schematic and wiring diagrams of alarm and signal circuits. Circuits should involve use of switches, push buttons, bells, indicating light which are used in offices, hospitals, hotels and buses

Contactor Control Circuits : The circuit should incorporate remote control, interlocking, time delay, sequential operation, overload short circuit and no-load protection applicable to D.O.L starter Star-Delta starter Rotor resistance and reversing starters Contactor control schematic and wiring diagram for speed reversing of motors. Contactor control schematic and wiring diagram for fast and slow speeds of motors, Contactor control schematic and wiring diagram of sequential operation of motors, Control of pump motor with water level indicators.

Reference Books:

- 1.Electrical Design : K.B. Raina
- 2.Electrical M/C Design A.K. Shawney
- 3.Electrical Drawing and Design Jaggi
- 4.Electrical Engg. Drawing Surjit singh

DEC 603 MICROPROCESSORS AND MICROCONTROLLER

3L-0T-0P-3C

M.M.100

MODULE-I INTRODUCTION: Evolution of microprocessor, Digital computer, Organisation of computer, Definition of, Instruction, Program, Machine language, Assembly language, High level language, Compiler and Assembler

MODULE-II NUMBER SYSTEMS: Decimal, hexadecimal, binary and octal numbers and conversion of one number system to another, 1's complement, 2's complement, Binary addition, Binary subtraction using 1's complement and 2's complement

MODULE-III MICROPROCESSORS ARCHITECTURE (INTEL 8085): Functional block diagram, Pin-Out diagram with description, Buses, Address bus, Data bus, Control bus, Registers, Arithmetic and logic unit, Timing and control unit, Types of instructions and classification into groups, Types of addressing modes, Status flags

MODULE-IV PROGRAMMING AND APPLICATION OF MICROPROCESSOR: Some examples of assembly language programme, Introduction to circuits (block diagram only) used in electrical application, ADC, DAC, Analog Multiplexer, Sample and Hold, Programmable peripheral interface (PPI)

MODULE-V MEMORY, I/O INTERPHASING AND APPLICATIONS OF MICROPROCESSOR: Schematic diagram of memory chips decoder, memory inter-phasing. Memory I/O data transfer scheme. Peripheral devices like 8155/8156/8255 -mode 0 & 1. Inter-phasing of switches, LEDs, Temperature control of furnace using microprocessor, traffic light control, SCR firing angle control, Data acquisition system.

Text/Reference Books:

1. Electrical and Electronic Measurement & Instrument, S. Rambhadran
2. Electrical and Electronic Instrumentation, A.K. SAWNY, Dhanpat Rai Pub
3. Mechanical and Industrial Measurement, R.K. Jain, Khanna Publishers
4. A work book on instrumentation, TTTI-Bhopal

DEC 604 DIGITAL SIGNAL PROCESSING LAB

0L-0T-4P-2C

M.M.100

MODELLING AND SIMULATION USING MATLAB:

1. Realising a given block diagram having multiplier, adder/subtractor and system (Discrete/Continuous) with given Impulse response. Calculating output for given input.
2. To simulate the transmitter and receiver for BPSK
3. To design and simulate FIR digital filter (LP/HP).
4. To design and simulate IIR digital filter (LP/HP).

DSP Lab using TMS320C6XXX DSP Kits:

5. To study the architecture of TMS320C6XXX DSP kits using Bloom with DSP.
6. To generate wave form (SINE, COSINE, SQUARE & TRIANGULAR).
7. Verification of Sampling Theorem.
8. Verification of linear/circular convolution.
9. To design FIR & IIR digital filter (LP/HP).

DEC 605 MICROPROCESSORS & MICROCONTROLLER LAB

0L-0T-4P-2C

M.M.100

LABORATORY EXPERIMENTS:

1. Study of Intel 8085 microprocessors
2. Program to add two 8-bit numbers
3. Program to subtract two 8-bit numbers
4. Program to find 1's complement of an 8-bit numbers
5. Program to find 2's complement of a 8-bit numbers
6. Program to shift an 8-bit number left by one bit
7. Program to mask of least significant 4 bits of an 8 bit number
8. Program to mask of most significant 4 bits of an 8 bit number
9. Program to find square from look up table
10. Program to find largest of two numbers
11. Program to find smallest of two numbers
12. Program to arrange a series of numbers in descending order
13. Program to arrange a series of numbers in ascending order

DEC 606 MICROWAVE ENGINEERING LAB

0L-0T-4P-2C

M.M.100

LIST OF EXPERIMENTS:

1. Study of various microwave components and instruments like frequency meter, attenuator, Detector & VSWR meter.
2. Draw V-I characteristics of microwave source like Gunn diode/ Reflex Klystron.
3. Measurement of frequency and wavelength in a rectangular waveguide.
4. Measurement of VSWR (small as well as large values) & reflection coefficient.
5. Measure unknown impedance with smith chart.
6. Draw the following characteristics of Gunn Diode
 - (i) Output power and frequency as a function of voltage
 - (ii) Square wave modulation by PIN diode.
7. Drawing polar pattern of Horn antenna.
8. To observe the action of directional coupler and its use in separating incident & reflected wave.
9. Study of Magic Tee, Circulator, and isolator
10. Study of spectrum analyser & its use in observing the response of
 - (i) High frequency amplifier
 - (ii) Low pass, high pass, band pass, band reject filters.

**DEE 605 ELECTRONIC & ELECTRICAL DRAWING DESIGN AND
FABRICATION LAB**

0L-0T-4P-2C

M.M.100

LIST OF EXPERIMENTS:

1. Draw Electrical and Electronic symbols used in electrical and electronic installation like light, power ,alarm & control circuits etc.
2. Draw Simple light and Alarm Circuits
 - a. One lamp controlled by two switches(staircase circuit)
 - b. Two lamps controlled by three switches(double staircase circuit)
 - c. Circuit using master switch
 - d. Fluorescent tube controlled from one switch
3. Draw Simple Alaram Circuits
 - a. One bell controlled by one push button
 - b. Two ordinary bells (for day and night)used at a distant residence
 - c. Nos of bells controlled by separate switches
 - d. Bell response circuit using one bell and one relay
 - e. Bell response circuit of an office(for three rooms)
 - f. Traffic light control system for two road crossing
4. Design and draw wiring circuit of a two room set for light and fan circuit
 - a. To draw Installation plan and wiring diagram of two house
 - b. Conductor size calculation
 - c. List of material required with cost by doing market survey
 - d. Description of various tests the wiring installation before commissioning
5. Orthographic Projection of Simple Insulators and Fuse
 - a. Kit kat fuse base
 - b. Kit kat fuse carrier
 - c. Bus bar post
 - d. Pin type and shackle type insulator
 - e. Stay insulators
6. Orthographic Projection of Simple Electrical parts
 - a. Engineering transistor
 - b. M.C.B.
 - c. E.L.C.B.Bobbin of a small transformer/choke

DEC 607 PROJECT WORK AND INDUSTRIAL VISIT

0L-0T-4P-3C

M.M.100

Project Work & Industrial Visit is a continuation of project phase I started in the fifth semester. There would be two reviews in the sixth semester, first in the middle of the semester and the second at the end of the semester. First review is to evaluate the progress of the Project work and industrial visit, presentation and discussion. Second review would be a pre-submission presentation before the evaluation committee to assess the quality and quantum of the work done. The final evaluation will be done based on internal as well as external.

DEC 608 CAMPUS RECRUITMENT TRAINING –II (TECHNICAL)

0L-0T-2P-1C

M.M.100

As a part of the curriculum, the Campus Recruitment Training-II (Technical) forms an important component of education for Diploma student. It is an attempt to bridge the gap between conventional study and competitive exam study or campus placement. The Program, which would be a help in government jobs as well as top private companies. In the process, it provides training for the students to improve their technical skill as per requirement. This program benefits the student to understand what he/she has studied in the class room and what is being practiced in competitive exam for government and private jobs.

Campus Recruitment Training (Technical) II covers **Power Electronics:** SCR, IGBT, GTO, TRIAC DIAC, single phase converter, three phase converter, Inverter, Voltage Regulator, cyclo-conveter, chopper. **Control System:** Block Diagram, PID controller, input signals and compensating networks. **Microprocessor:** Introductions of 8085, 8086 microprocessor, construction, block diagrams. The program mainly focuses on multiple choice question which help students for their preparation.