



SCHEME FOR THIRD SEMESTER (ELECTRICAL ENGINEERING)

Sr. No.	Subject	Study Scheme			EVALUATION SCHEME						Total Marks
					INTERNAL ASSESSMENT		EXTERNAL ASSESMENT (EXAMINATION)				
					Theory	Practical	Written Paper		Practical		
					Max. Marks	Max. Marks	Max. Marks	Hrs.	Max. Marks	Hrs.	
3.1*	Electrical and Electronics Engineering Materials	4	-	-	25	-	100	3	-	-	125
3.2*	Electrical Measurements and Measuring Instruments	4	-	2	25	25	100	3	50	3	200
3.3*	Electronics - I	4	-	2	25	25	100	3	50	3	200
3.4*	Electrical Engineering Design and Drawing – I	-	-	6	-	75	100	3	50 (viva)	-	225
3.5*	Computer Programming and Applications	2	-	4	25	25	100	3	50	3	200
3.6*	Electrical Workshop Practice	-	-	6	-	100	-	-	50	3	150
# Student Centered Activities including Entrepreneurial Awareness Camp		-	-	6	-	25	-	-	-	-	25
Total		14	-	26	150	275	500	-	250	-	1125

* Common with other diploma programmes

** Common with diploma programme in Power Station Engineering

+ Includes 25 marks for Viva-voce

Student Centered Activities will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g.

photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defense/Disaster Management activities etc.



PM
POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

SYLLABUS: Polytechnic (EE)

Department: Electrical Engineering – 3rd Semester

Subject: Electrical and Electronics Engineering Materials (Theory)

Subject Code: 120931

Detailed Contents

Unit No.1 Classification

- Topic No.1: Classification of Materials
- Topic No.2: Classification of Materials based on Atomic Structure
- Topic No.3: Classification of Materials based on Energy Bands

Unit No.2 Conducting Materials

- Topic No.4: Introduction of Conducting Materials
- Topic No.5: Resistance & factors affecting Resistance
- Topic No.6: Classification of conducting materials as low resistivity & high resistivity materials
- Topic No.7: To study the properties of Copper, Aluminum, Steel
- Topic No.8: Low resistivity Copper Alloys: Brass, Bronze and their applications
- Topic No.9: Applications of Special metals e.g. Silver, Gold, Platinum
- Topic No.10: High resistivity materials & their applications e.g. Managing, Constanting, Nichrome, Mercury, Carbon, Tungsten
- Topic No.11: Introduction to Bundle Conductors and its Applications
- Topic No.12: Superconductors and their Applications

Unit No.3 Semi-Conducting Materials

- Topic No.13: Atomic Structure of Germanium (Ge), Silicon (Si), Carbon(C)
- Topic No.14: Semiconductors and types of Semiconductors
- Topic No.15: Conduction through P-type and N-type Semiconductor

Unit No.4 Insulating materials - General Properties:

- Topic No.16: Electrical Properties: Volume resistivity, surface resistance, dielectric loss, dielectric strength (breakdown voltage), dielectric constant
- Topic No.17: Physical Properties: Hygroscopicity, tensile and compressive strength, abrasive resistance, brittleness
- Topic No.18: Thermal Properties: Heat resistance, classification according to permissible temperature rise. Effect of overloading on the life of an electrical appliance, increase in rating with the use of insulating materials having higher thermal stability, Thermal conductivity, Electro-thermal breakdown in solid dielectrics
- Topic No.19: Chemical Properties: Solubility, chemical resistance, weather-ability
- Topic No.20: Mechanical properties, mechanical structure, tensile structure

Unit No.5 Insulating materials and their Applications

- Topic No.21: Plastics: Definition and classification
- Topic No.22: Thermosetting materials:
- Topic No.23: Phenol-formaldehyde resins (i.e. Bakelite) amino resins (urea formaldehyde and Melamine-formaldehyde), epoxy resins-their important properties and applications
- Topic No.24: Procedure for preparation of plastic (PVC)
- Topic No.25: Thermo-plastic materials: Polyvinyl chloride (PVC), polythene, silicon, their important properties and applications
- Topic No.26: Natural insulating materials, properties and their applications
- Topic No.27: Mica and Mica products
- Topic No.28: Asbestos and asbestos products
- Topic No.29: Ceramic materials (porcelain and stiletto)
- Topic No.30: Glass and glass products, Cotton, Silk
- Topic No.31: Paper (dry and impregnated)
- Topic No.32: Rubber, Bitumen
- Topic No.33: Mineral and insulating oil for transformers switchgear capacitors
- Topic No.34: High voltage insulated cables, insulating varnishes for coating and impregnation
- Topic No.35: Enamels for winding wires



Topic No.36: Glass fiber sleeves

Topic No.37: Gaseous insulating materials; Air, Hydrogen, Nitrogen, SF₆, their properties and applications

Unit No.6 Magnetic Materials

Topic No.38: Introduction -Types of magnetic materials, permeability, B-H curve, magnetic saturation

Topic No.39: Hysteresis loop including coercive force & residual magnetism

Topic No.40: Concept of eddy current and hysteresis loss, curie temperature, magnetostriction effect

Topic No.41: Method of reduction of eddy current loss and hysteresis loss

Topic No.42: Soft Magnetic Materials and applications

Topic No.43: Alloyed steels with silicon: High silicon alloy steel for transformers, low silicon alloy steel for electric rotating machines

Topic No.44: Cold rolled grain oriented steels for transformer

Topic No.45: Non-oriented steels for rotating machine and applications

Topic No.46: Nickel-iron alloys, Soft Ferrites and applications

Topic No.47: Hard magnetic materials and applications

Topic No.48: Tungsten steel, chrome steel, cobalt steel and applications

Topic No.49: Hard ferrites and applications

Unit No.7 Special Materials

Topic No.50: Thermocouple & applications

Topic No.51: Bimetals & applications

Topic No.52: Lead soldering & applications

Topic No.53: Fuse materials & applications

Unit No.8 Introduction of various Engineering materials

Topic No.54: Introduction of various Engineering materials necessary for fabrication of electrical machines such as motors, generators, transformers etc.

STUDY SCHEME		EVALUATION SCHEME						Total Marks
		Internal Assessment		External Assessment(Examination)				
Hrs/week		Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs
4	-	-	25	-	100	3	-	-
		125						

REFERENCE BOOKS:

1. Electrical and Electronic Engineering Materials by SK Bhattacharya, Khanna Publishers, New Delhi
2. Electronic Components and Materials by Grover and Jamwal, Dhanpat Rai and Co., New Delhi
3. Electrical Engineering Materials by Sahdev, Uneek International Publications
4. Electronic Components and Materials by SM Dhir, Tata Mc Graw Hill, New Delhi
5. Electrical Engineering Materials by PL Kapoor, Khanna Publishers, New Delhi
6. Electrical and Electronics Engineering Materials BR Sharma and Others, Satya Parkashan, New Delhi
7. Electrical and Electronics Engineering Materials DR Arora, Ishan Publications, Ambala City

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPERSETTER

Sr. No	Topic	Time Allotted (Hrs)	Marks Allocation (%)
1	Classification	03	5
2	Conducting Materials	12	20
3	Review of Semi-conducting Materials	02	5
4	Insulating materials; General Properties	12	20
5	Insulating Materials and their Applications	16	25
6	Magnetic Materials	11	15
7	Special Materials	04	5
8	Introduction of various Engineering Materials	04	5
Total		64	100



Detailed Contents

Unit No.1 Introduction to Electrical Measuring Instruments

- Topic No.1: Concept of measurement and measuring instruments
- Topic No.2: Types of electrical measuring instruments
- Topic No.3: Types of electrical measuring instruments—indicating, integrating and recording type instruments
- Topic No.4: Essentials of indicating instruments—deflecting, controlling and damping torque

Unit No.2 Ammeters and Voltmeters (Moving coil and moving iron type)

- Topic No.5: Concept of ammeters and voltmeters and difference between them
- Topic No.6: Extension of range of voltmeters and ammeter
- Topic No.7: Construction and working principles of moving coil Instruments
- Topic No.8: Merits and demerits, sources of error and application of moving coil Instruments
- Topic No.9: Construction and working principles of moving iron Instruments
- Topic No.10: Merits and demerits, sources of error and application of moving iron Instruments

Unit No.3 Wattmeter (Dynamometer Type)

- Topic No.11: Construction and working principle, of dynamometer type wattmeter
- Topic No.12: Merits and demerits of dynamometer type wattmeter
- Topic No.13: Sources of error of dynamometer type wattmeter

Unit No.4 Energy meter (Induction type)

- Topic No.14: Construction and working principle of single-phase Energy meter
- Topic No.15: Merits and demerits of Single-phase energy meter
- Topic No.16: Construction and working principle of Three-phase Energy meter
- Topic No.17: Merits and demerits of Three-phase energy meter
- Topic No.18: Errors and their compensation
- Topic No.19: Simple numerical problems
- Topic No.20: Construction and working principle of maximum demand indicators

Unit No.5 Miscellaneous Measuring Instruments

- Topic No.21: Construction, working principle and application of Meggar
- Topic No.22: Construction, working principle and application of Earth tester
- Topic No.23: Construction, working principle and application of Multimeter
- Topic No.24: Construction, working principle and application of Frequency meter (dynamometer type)
- Topic No.25: Construction, working principle and application of single phase power factor meter (Electrodynamometer type)
- Topic No.26: Working principle of synchroscope and phase sequence indicator
- Topic No.27: Working principle of tong tester (Clamp-on meter)
- Topic No.28: Instrument Transformers: Construction, working and Applications of CT and their ratio and phase angle Error
- Topic No.29: Construction, working and Applications of PT and their ratio and phase angle error

Unit No.6 Electronic Instruments

- Topic No.30: Cathode Ray Oscilloscope: Block diagram, working principle of CRO and its various controls. Applications of CRO
- Topic No.31: Digital multi-meter (only block diagram) and Applications

Unit No.7 LCR meter

- Topic No.32: Study of LCR meter and its applications

Unit No.8 Power Measurements in 3-phase circuits

- Topic No.33: 2 wattmeter method in balanced and unbalanced Circuits and simple problems
- Topic No.34: Three wattmeter method

Unit No.9 Measurement of Non-electrical Quantities

- Topic No.35: Basic concept of pressure measurement, flow measurement, level measurement, displacement measurement using transducers



Unit No.10 Measurement of Temperature

Topic No.36: Different types of thermometers and their Construction, principle and working

Topic No.37: Different types of thermocouple and their Construction, principle and working

Topic No.38: Different types of resistance temperature detector and their Construction, principle and working

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment(Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
4	-	-	25	-	100	3	-	-	125

REFERENCE BOOKS:

1. Electrical Measurements and Measuring Instruments by Golding and Widdis; Wheeler Publishing House, New Delhi
2. Electrical Measurements and Measuring Instruments by SK Sahdev, Unique International Publications, Jalandhar
3. A Course in Electrical Measurement and Measuring Instruments by AK Sawhney and PL Bhatia; Dhanpat Rai and Sons, New Delhi
4. Electric Instruments by D. Cooper
5. Experiments in Basic Electrical Engineering by SK Bhattacharya and KM Rastogi, New Age International (P) Ltd., Publishers, New Delhi
6. Electronics Instrumentation by Umesh Sinha, Satya Publication, New Delhi
7. Basic Electrical Measurements by Melville B. Staut.
8. Electrical Measurement and Measuring Instruments by JB Gupta, SK Kataria and Sons, New Delhi
9. Electrical Measurement and Measuring Instruments by ML Anand, SK Kataria and Sons, NewDelh

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER

Sr. No	Topic	Time Allotted (hrs)	Marks Allocation (%)
1	Introduction to Electrical Measuring Instruments	06	10
2	Ammeters and Voltmeters	12	20
3	Watt Meter	04	5
4	Energy Meter	06	10
5	Miscellaneous Measuring Instruments	12	20
6	Electronic Instruments	06	10
7	LCR Meters	04	5
8	Power Measurements in 3-phase circuits	06	10
9	Measurement of Non-electrical quantities	04	5
10	Measurement of Temperature	04	5
	Total	64	100



LIST OF PRACTICALS

1. Use of analog and digital multimeter for measurement of voltage, current (a.c/d.c) and resistance
2. To calibrate 1-phase energy meter by direct loading method.
3. To measure the value of earth resistance using earth tester.
4. To measure power, power factor in a single-phase circuit, using wattmeter and power factor meter and to verify results with calculations.
5. Measurement of power and power factor of a three-phase balanced load by two wattmeter method.
6. Measurement of voltage and frequency of a sinusoidal signal using CRO and draw wave shape of signal.
7. Measurement of power in a 3 phase circuit using CT, PT and 3-phase wattmeter.
8. Use of LCR meter for measuring inductance, capacitance and resistance.
9. To record all electrical quantities from the meters installed in the institution premises.
10. To measure Energy at different Loads using Single phase Digital Energy meter.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment(Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	75



Detailed Contents

Unit No 1 Symbols and Signs Conventions

Topic No.1: Various Electrical Symbols used in Domestic and Industrial Installation and Power System as per BIS

Unit No 2 Panels/Distribution Boards

Topic No.2: Design and Drawing of panels/Distribution board using MCBs, ELCB, main switches and change over switches for domestic installation, industrial and commercial installation.

Unit No 3 Orthographic projections of Simple Electrical Parts

Topic No.3: Kit Kat

Topic No.4: Bus bar post/ Kit Kat

Topic No. 5: Pin type and shackle type insulator (Pin Type 11kV/66kV)

Topic No. 6: Bobbins of a small transformer / choke

Topic No. 7: Stay insulators/Suspension type insulators

Topic No. 8: Free hand sketching of M.C.B. and E.L.C.B Placed on Distribution Board.

Unit No 4 Orthographic Projection of Machine Parts

Topic No. 9: Rotor of a squirrel cage induction motor

Topic No.10: Motor body (induction motor) as per IS Specifications

Topic No.11: Slip rings of 3-phase induction Motor.

Topic No.12: Stator of 3 phase Induction motor

Unit No 5 Contactor Control Circuits:

Topic No.13: DOL Starter of 3-phase induction Motor.

Topic No.14: Forwarding/reversing of 3-phase induction motor

Topic No.15: Limit switch control of a 3-phase induction motor

Topic No.16: Sequence operation of two motors using T.D.R.

Topic No.17: Two speed motor control.

Topic No.18: Automatic star-delta starter for 3-phase induction motor.

STUDY SCHEME		EVALUATION SCHEME							Total Marks
		Internal Assessment		External Assessment (Examination)					
Hrs/week		Theory	Practical	Written Paper		Practical			
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-		6	-	75	100	3	50	3	225

RECOMMENDED BOOKS

1. Electrical Engineering Design and Drawings by Surjeet Singh, Dhanpat Rai and Co, New Delhi
2. Electrical Engineering Design and Drawings by SK Bhattacharya, SK Kataria and Sons, New Delhi
3. Electrical Engineering Design and Drawings by Ubhi & Marwaha, IPH, New Delhi
4. Electrical Design and Drawing by SK Sahdev, Uneek Publications, Jalandhar
5. Electrical Engineering Drawing by Surjit Singh, SK Kataria and Sons, New Delhi

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPERSETTER

Sr. No	Topic	Time Allotted (Hrs)	Marks Allocation (%)
1	Symbols and Signs Conventions	6	10
2	Design and Drawing of panels	18	20
3	Orthographic projections of simple electrical parts	24	20
4	Drawing of Machine Parts	24	25
5	Contactor Control Circuits	24	25
Total		96	100



Detailed Contents

Unit No 1 Introduction

- Topic No.1: Electronic components, Active and passive components
- Topic No.2: Concept of current and voltage sources, constant voltage and current sources, their graphical representation.
- Topic No.3: Conversion of voltage source into current source and vice-versa
- Topic No.4: Difference between actual voltage source and constant voltage source

Unit No 2 Semi-conductor Physics

- Topic No.5: Atomic structure, crystalline structure, Energy band theory of crystals, energy band structure of insulator
- Topic No.6: semiconductor and conductor, generation and recombination of electron hole pairs.
Energy band structure of Silicon and Germanium
- Topic No.7: Silicon versus Germanium for mobility and conductivity, Concept of Doping, Intrinsic and extrinsic semiconductors
- Topic No.8: Effect of temperature on intrinsic and extrinsic semiconductors

Unit No 3 Semiconductor Diodes

- Topic No.9: PN Junction, mechanism of current flow in PN junction, drift and diffusion currents, depletion layer, Potential barrier, effect of forward and reverse biasing in a PN junction.
Concept of junction capacitance in forward and reverse biased conditions. Breakdown mechanism
- Topic No.10: Ideal diode, Semiconductor diode characteristics, static and dynamic resistance
- Topic No.11: Use of diode as half wave and full wave rectifiers (centre tapped and bridge type),
Relation between DC output and AC input voltage, rectifier efficiency
- Topic No.12: Concept of ripples, filter circuits – shunt capacitor, series inductor, and pie (π) filters and their applications Diode ratings/specifications
- Topic No.13: Various types of diodes such as zener diode, varactor diode, schottky diode, light emitting diode, Tunnel diode, photo diode; their working characteristics and applications
- Topic No.14: Zener diode and its characteristics, Use of zener diode for voltage stabilization

Unit No 4 Bi-polar Transistors

- Topic No.15: Concept of junction transistor, PNP and NPN transistors, their symbols and mechanism of current flow
- Topic No.16: Transistor configurations: common base (CB), common emitter (CE) and common collector (CC)
- Topic No.17: Current relation and their input/output characteristics; comparison of the three configurations

Unit No 5 Transistor Biasing and Stabilization

- Topic No.18: Transistor biasing, its need, operating point, effect of temperature on the operating point of a transistor and need of stabilization of operating point.
- Topic No.19: Different biasing circuits, limitations, simple problems to calculate operating point in different biasing circuits. Use of Thevenin's theorem to determine operating point
- Topic No.20: Concept of h-parameters of a transistor, Use of data book to know the parameters of a given transistor

Unit No 6 Single-Stage Transistor Amplifiers

- Topic No.21: Single stage transistor amplifier circuit in CE configuration, function of each component
- Topic No.22: Working of single stage transistor amplifier, physical and graphical explanation, phase reversal
- Topic No.23: Concept of DC and AC load line, Voltage gain of single stage transistor amplifier using characteristics of the device
- Topic No.24: Concept of input and output impedance, AC equivalent circuit of single stage transistor amplifiers
- Topic No.25: Calculation of voltage gain using AC equivalent circuit, Frequency response of a single stage transistor amplifier

Unit No 7 Multi-Stage Transistor Amplifiers

- Topic No.26: Need of multi-stage transistor amplifiers – different types of couplings, their purpose and applications.
- Topic No.27: Knowledge of various terms such as voltage gain, current gain, power gain, frequency response, decibel gain and band width
- Topic No.28: RC coupled two-stage amplifiers, circuit details, working, frequency response, applications



Topic No.29: Loading effect in multistage amplifiers, Elementary idea about direct coupled amplifier, its limitations and applications

Topic No.30: Transformer coupled amplifiers, its frequency response. Effect of co-efficient of coupling on frequency response. Applications of transformer coupled amplifiers

Unit No 8 Field Effect Transistor (FET)

Topic No.31: Construction, operation, characteristics and applications of a N channel JFET and P channel JFET, JFET as an amplifier

Topic No.32: Types, construction, operation, characteristics and applications of a MOSFET, Comparison between BJT, JFET and MOSFET

STUDY SCHEME			EVALUATION SCHEME						Total Marks
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Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
4	-	-	25	-	100	3	-	-	125

RECOMMENDED BOOKS

1. Basic Electronics and Linear Circuit by NN Bhargava, Kulshreshta and SC Gupta, Tata McGraw Hill Education Pvt Ltd, New Delhi.
2. Electronic Principles by SK Sahdev, Dhanpat Rai & Co., New Delhi
3. Principles of Electrical and Electronics Engineering by VK Mehta; S Chand and Co., New Delhi
4. Electronic Components and Materials by SM Dhir, Tata McGraw Hill Publishing Company Pvt Ltd, New Delhi.
5. Principles of Electronics by SK Bhattacharya and Renu Vig, SK Kataria and Sons, Delhi
6. Electronics Devices and Circuits by Millman and Halkias; McGraw Hill.
7. Principles of Electronics by Albert Paul Malvino; Tata McGraw Hill Education Pvt Ltd, New Delhi.
8. Basic Electronics – Problems and Solutions by Albert Malvino and David J. Bates; Tata McGraw Hill Education Pvt Ltd, New Delhi.
9. Basic Electronics by J.S. Katre, Sandeep Bajaj, Tech. Max. Publications, Pune.
10. Analog Electronics by DR Arora, Ishan Publications, Ambala City.
11. Analog Electronics by JC Karhara, King India Publication, New Delhi
12. Electrical Devices and Circuits by Rama Reddy, Narosa Pulishing House Pvt. Ltd., New Delhi
13. Electronic Devices and Circuits by Dharma Raj Cheruku and Battula Tirumala Krishna: Pearson Education (Singapore) Pvt Ltd., Indian Branch, 482 F.I.E Patparganj, Delhi- 92
14. Basic Electronics by JB Gupta, SK Kataria and Sons, New Delhi
15. Grob's Basic Electronics- A text Lab Manual (Special Indian Edition) by Schultz, Tata McGraw Hill Education Pvt Ltd, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER

Sr. No	Topic	Time Allotted (Hrs)	Marks Allocation (%)
1	Introduction	5	10
2	Semi-conductor Physics	10	15
3	Semiconductor Diodes	10	15
4	Bi-polar Transistors	7	10
5	Transistor Biasing and Stabilization	8	15
6	Single-Stage Transistor Amplifiers	10	15
7	Multi-Stage Transistor Amplifiers	7	10
8	Field Effect Transistor	7	10
	Total	64	100



LIST OF PRACTICALS

1. a) Identification and testing of electronic components such as resistor, inductor, capacitor, diode, transistor and different types of switches used in Electronic circuits
b) Measurement of resistances using multimeter and their comparison with colour code values
2. V-I characteristics of a Semiconductor diode and to calculate its static and dynamic resistance
3. a) V-I characteristics of a zenor diode and finding its reverse breakdown voltage
b) Fabrication of a zenor diode voltage stabilizer circuit using PCB
4. Observation of input and output wave shapes of a half-wave rectifier and verification of relationship between dc output and ac input voltage
5. Observation of input and output wave shapes of a full wave rectifier and verification and relationship between dc and ac input voltage
6. Observation of input and output wave shapes of a full wave rectifier with
 - (i) shunt capacitor)
 - (ii) series inductor
 - (iii) π filter circuits
7. Plotting input and output characteristics of a transistor in CB configuration
8. Plotting input and output characteristics of a transistor in CE configuration
9. Measurement of operating point in case of
 - (i) fixed biased circuit
 - (ii) potential divider biasing circuit and to observe the effect of temperature variation on the operating point.
10. To measure the voltage gain and band width by plotting frequency response curve of a single stage amplifier using CE configuration at different loads
11. To study the effect of coupling capacitor on lower cut off frequency and upper cut off frequency by plotting frequency response curve of a two stage RC coupled amplifier
12. To plot V-I characteristics of a FET

STUDY SCHEME		EVALUATION SCHEME						Total Marks	
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Hrs/week		Theory	Practical	Written Paper		Practical			
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	125



Detailed Content

Unit No.1 Algorithm and Program Development

- Topic No.1: Steps in development of a program
- Topic No.2: Flow-charts
- Topic No.3: Algorithm development
- Topic No.4: Approaches towards Programming
- Topic No.5: Introduction to various computer languages
- Topic No.6: Low level language: machine & assembly language
- Topic No.7: High level language (HLL)
- Topic No.8: Introduction to translators: Assembly, Compiler, And Interpreter

Unit No.2 Fundamentals of C Programming

- Topic No.9: Overview of C: History of 'C' Features and Characteristics, Structure of C, Headerfiles.
- Topic No.10: I/O Statements: input output statements, Assignment Statement
- Topic No.11: Variables, Constants, Data types, Operators & Expressions with their precedence
- Topic No.12: Standard Formatted and Unformatted I/O function
- Topic No.13: Control Structures: Decision and Loop statements
- Topic No.14: if-else, while, do-while, for loops
- Topic No.15: Breaks, switch statements
- Topic No.16: Function: introduction of function, function declaration and definition
- Topic No.17: Parameter passing-call by value-call by reference, storage class specifier
- Topic No.18: Local and Global Variables, standard library function, recursion
- Topic No.19: Arrays: introduction to array, array declaration and initialization
- Topic No.20: Single and multi dimensional arrays, character arrays
- Topic No.21: Pointers: introduction to pointers, declaration and initialization
- Topic No.22: Address operators & pointers, to various data types
- Topic No.23: Pointers in parameters passing, pointers to function
- Topic No.24: Structures: Declaration & definition of a structure, pointer to structure
- Topic No.25: Union and array of structure, self referential structures
- Topic No.26: Strings: string processing, functions and standard library function
- Topic No.27: Data files: file handling and manipulation, file reading and writing
- Topic No.28: Binary and ASCII files
- Topic No.29: file records using standard function type mouse

Unit No.3 Software Application in Electronics Engineering

- Topic No.30: Computer application overview through various application software related to Electronics Engineering branch viz: ORCAD
- Topic No.31: PSPICE, OPTSIM
- Topic No.32: KEIL, Circuit Maker
- Topic No.33: MATLAB, Electronic Workbench

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
4	-	-	25	-	100	3	-	-	125



PM POLYTECHNIC

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Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

Use of Recommended Books

1. Programming in C by Balagurusamy, Tata McGraw Hill Education Pvt Ltd, New Delhi
2. Programming in C by Gottfried, Tata McGraw Hill Education Pvt Ltd, New Delh
3. Let us C- Yashwant Kanetkar, BPB Publications, New Delhi
4. Computer Programming and Applications by Preeti Chhabra, Ishan Publication.
5. Programming in C by R Subburaj, Vikas Publishing House Pvt. Ltd., Jangpura, New Delhi
6. Programming in C by Kris A Jansa, Galgotia Publications Pvt. Ltd., Daryaganj, New Delhi
7. Programming in C by BP Mahapatra, Khanna Publishers, New Delhi
8. Pointers in C by Yashwant Kanetkar, BPB Publishers New Delhi
9. Programming in Applications by Chandershekar, Unique International Publications, Jalandhar

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER

Topic No.	Topic Name	Time Allotted(Hrs)	Marks Allocation (%)
1	Algorithm and Program Development	4	15
2	Program Structure (C Programming)	24	70
3	Program Structure (C Programming)	4	15
Total		32	100



PM POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

Subject: Computer Programming and Application (Practical)

Subject Code: 121035(P)

LIST OF PRACTICALS

1. Programming exercise on executing a C Programs.
2. Programming exercise on editing a C program.
3. Programming exercise on defining variables and assigning values to variables
4. Programming exercise on arithmetic and relation operators
5. Programming exercise on arithmetic expressions and their evaluation
6. Programming exercise on reading a character
7. Programming exercise on writing a character
8. Programming exercise on formatting input using print
9. Programming exercise on formatting output using scan
10. Programming exercise on simple IF statement
11. Programming exercise on IF... ELSE statement
12. Programming exercise on SWITCH statement
13. Programming exercise on GOTO statement
14. Programming exercise on DO-WHILE statement
15. Programming exercise on FOR statement
16. Programming exercise on one dimensional arrays
17. Programming exercise on two dimensional arrays
18. Demonstration of Application software to Electrical Engineering branch such as: MATLAB, PSIM,
19. MULTISIM, PSPICE in Electrical Engineering

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	75



LIST OF PRACTICALS

1. Study of electrical safety measures as mentioned in the Electricity Rules and shock treatment including first aid
2. Wire jointing
 - 2.1 Straight married joint
 - 2.2 Technology-joint
 - 2.3 Western union joint
 - 2.4 Britania joint
3. Study of ISI standard for MCBs and Conduct one test on MCB
4. Wiring of main distribution board with four outgoing circuits for light and fan loads including main switch and fuses(only internal connection) Types of wiring and to make different light control circuits in the following types of wiring:
 - 4.1 Casing and Capping (PVC) wiring
 - 4.2 Conduit wiring (surface/concealed)
5. Construction/assembly of Distribution Board and Extension Board Construction of an extension board with two 5A sockets and one 15A Socket controlled by their respective switches, a fuse and indicator with series test lamp provision.
6. 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) Two ordinary bells (for day and night) used at a distant residence
 - 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 roads crossing.
7. Fault finding and repair of a tube light circuit
8. Connections of single phase and 3-phase motors, through an appropriate starter and to change their direction of rotation
9. Wiring, testing and fault finding of the following contactor control circuits operating on 3-phase supply:
 - a) Remote control circuits
 - b) Time delay circuits
 - c) Inter locking circuits
 - d) Sequential operation control circuits
10. Power cable jointing using epoxy based jointing kits
11. Dismantling/assembly of star-delta and DOL starter
12. Repair and maintenance of domestic electric appliances such as electric iron, geyser, fan, heat convector, desert cooler, room heater, electric kettle, electric oven, electric furnace etc.
13. Dismantling/assembly/maintenance of motor operated appliances such as mixer, blender, drill machine etc.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	6	-	100	-	-	50	3	150