FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABUS

FOR

DIPLOMA COURSE IN MAINTENANCE OF ELECTRONICS INSTRUMENTS (FULL TIME)

(SEMESTER – I & II)

SESSION: 2019–20

GURU NANAK DEV UNIVERSITY, AMRITSAR

Diploma Course in Maintenance of Electronics Instruments (Full Time) (Semester System)

Course structure:

(i) Basic Course: (6-Month)

(ii) Diploma: (6-Month+6-Month=1-Year)

(iii) Advanced Diploma: (6-Month+6-Month+1-Year=2-Year)

The Diploma comprises Sl. No. (i) and (ii) as above.

The students of Diploma have to clear all the three examinations viz.

i) after six months from the enrolment session

ii) after one year from the enrolment session

Eligibility: The admission shall be open to a candidate who has passed **10+2 (Any Stream)** examination with at least 50% marks in aggregate (45% for SC/ST candidates).

Diploma Course in Maintenance of Electronics Instruments (Full Time) (Semester System)

Course Scheme

Course Code	Skill Component / General Education	Course Title	Hours per week			Credits	Total Marks	
			L	T	P		Theory	Practical
Semester-I (Total marks: 550)								
Paper - 1	**General Education**	**Communication Skills-I**	2	0	3	6	40	60
Paper - 2	**General Education**	**Computer Fundamentals-I**	2	0	3	6	40	60
Paper - 3	**Skill Component**	**Electronic Devices & Components**	3	0	3	6	60	40
Paper - 4	**Skill Component**	**Basics of Electrical Engineering**	3	0	3	6	60	40
Paper - 5	**Skill Component**	**Electronic Measurements & Instruments**	3	0	3	6	60	40
Paper – 6	**Skill Component**	**Electronics Workshop**	0	0	3	3	-	50
			31			**33**		
Semester-II (Total marks: 650)								
Paper – 7	**General Education**	**Communication Skills-II**	2	0	3	6	40	60
Paper – 8	**General Education**	**Computer Fundamentals-II**	2	0	3	6	40	60
Paper – 9	**Skill Component**	**Electronic Circuits & IC**	3	0	3	6	60	40
Paper – 10	**Skill Component**	**Elements of Digital Electronics**	3	0	3	6	60	40
Paper – 11	**Skill Component**	**Industrial Electronics**	3	0	3	6	60	40
Paper – 12	**Skill Component**	**Consumer Electronics**	3	0	3	6	60	40
Paper – 13	**Skill Component**	**Project**	0	0	3	3	-	50
			37			**39**		

Diploma Course in Maintenance of Electronics Instruments (Full Time) (Semester – I)

PAPER – 1: COMMUNICATION SKILLS-I

Time: 3 hours **M. Marks: 100**

Theory: 40

Practical 60

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Instructions: for Practical Exam: Entire syllabus will be covered for practical.

SECTION-A

Writing Skills

Formatting personal and business letters:

1. Standard informal personal letters such as letters to parents, friends, social pillars.
2. Standard formal letters to Govt. Officers, superiors, utility purposes, News Paper Editors etc.
3. Standard Business Letters: Introducing and Promoting business activities, Placing an order, Cancelling an order, Reporting defects in receipt of ordered goods, Reporting delay in receipt of ordered goods, Responding to delay in supply of goods and services, Maintaining good customer relationships, Making customers give feedback to your services, Creating catalogue of your goods and services, Acknowledging services rendered by others,

SECTION-B

1. Resume Writing.
2. Writing of memos, notices and customer-friendly information.
3. Basic punctuation.
4. Blog writing

SECTION-C

Speaking Skills

1. Using courtesy words and expressions
2. Storing standard day to day usages sentences, words and expressions in mind.
3. Creating similar new sentences
4. Using declarative, imperatives, interrogative and exclamatory sentences.

SECTION-D

1. Speaking catchy phrases , proverbs and expressions
2. Differentiating confusing words
3. Making PowerPoint presentation
4. Making short speech
5. Group Discussion/ Conversation

Suggested Readings/ Books:

1. KK Ramchandran, et al Business Communication, Macmillan, New Delhi
2. Swati Samantaray, Business Communication and Communicative English, Sultan Chand, New Delhi.
3. S.P. Dhanavel English and Communication Skills for Students of Science and Engineering (with audio CD)
4. Computer Mediated Communication 1st Edition by Crispin Thurlow (Lara Martin Lengel , Alice Tomic.
5. Collins, Patrick. Speak with Power and Confidence. New York: Sterling, 2009.
6. Fitikides, T. J. Common Mistakes in English. London: Orient Longman.

Diploma Course in Maintenance of Electronics Instruments (Full Time) (Semester – I)

PAPER – I: COMMUNICATION SKILLS-I

(PRACTICAL)

Instructions for Practical Exam: Entire syllabus will be covered for practical.

1. Speaking Skills
2. Using courtesy words and expressions
3. Storing standard day to day usages sentences, words and expressions in mind.
4. Speaking catchy phrases , proverbs and expressions
5. Making PowerPoint presentation
6. Making short speech
7. Group Discussion/ Conversation

PAPER – 2: COMPUTER FUNDAMENTALS-I

Time: 3 Hours **M. Marks: 100**
Theory: 40
Practical 60

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
Instructions: for Practical Exam: Entire syllabus will be covered for practical.

SECTION-A

Interacting with the computer:
Computer Components/ Input/ Output Devices: Input devices; keyboard, mouse, scanner, output devices; vdu and printer (impact and non-impact printers), plotter etc. Primary and secondary storage (auxiliary storage), secondary storage; magnetic disks – tracks and sectors, optical disk (cd, cd-rw and dvd memory). **Computer Software concept:** System software, application software, operating systems, advantages of software and application packages. Introduction to operating systems such as ms-dos and windows, difference between dos and windows

Operating system-MS-Windows
Operating system-Definition & functions, basics of Windows, Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders, Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance, Using windows accessories.

SECTION-B

Word Processor using Microsoft Office
Introduction to Word, Introduction to Parts of Word Window (Title Bar, Menu Bar, Tool Bar, The Ruler, Status Area), Page Setup, Creating New Documents, Saving Documents, Opening an Existing documents, insert a second document into an open document, Editing and formatting in document, Headers and Footers, Spell Checking, Printing document, Creating a Table Using the Table Menu and table formatting, Borders and Shading, Templates and Wizards, Mail Merge, importing, exporting and inserting files, formatting pages, paragraphs and sections, indents and outdents, creating lists and numbering, Headings, styles, fonts and font size Editing, positioning and viewing texts, Finding and replacing text, inserting page breaks, page numbers , book marks, symbols and dates.

SECTION-C

Presentation Software using Microsoft Office

Introduction to MS Power point, Power point elements, Templates, Wizards, Views, Exploring Power Point Menu, Working with Dialog Boxes, Adding Text, Adding Title, Moving Text Area, Resizing Text Boxes, Adding Art, Starting a New Slide, Starting Slide Show, Saving presentation; Printing Slides, Views (View slide sorter view, notes view, outlines view) Formatting and enhancing text formatting, Creating Graphs (Displaying slide show and adding multi – media)

SECTION-D

Spreadsheet using Microsoft Office

Elements of Electronics Spread Sheet and Ms-Excel: Application/usage of Electronic Spread Sheet, Opening of Spread Sheet, menu bar, Creation of cells and addressing of cells, Cell inputting.

Manipulation of cells: Enter texts numbers and dates, Creation of tables, Cell Height and Widths, Copying of cells.

Functions: Using functions: mathematical, statistical and financial function.

Spread sheets for Small accountings: Maintaining invoices/budgets, Totaling of various transactions, maintaining daily and monthly sales reports.

Charts: drawing different types of charts.

Reference Books:

1. Andrew S. Tanenbaum, David J. Wetherall Computer Networks (5th Edition), PHI.
2. P. K.Sinha, P. Sinha, Fundamentals of Computers, BPB Publishers.
3. A. Goel, Computer Fundamentals, Pearson Education.
4. Will Train, Gini Corter, Annette Marquis “Microsoft Office” BPB

PAPER – II: Computer Fundamentals-I

(PRACTICAL)

Instructions for Practical Exam: Entire syllabus will be covered for practical.

1. Operating system-MS-Windows

Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders, Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance, Using windows accessories.

2. Word Processor using Microsoft Office

Parts of Word Window (Title Bar, Menu Bar, Tool Bar, The Ruler, Status Area), Page Setup, Creating New Documents, Saving Documents, Opening an Existing documents, insert a second document into an open document, Editing and formatting in document, Headers and Footers, Spell Checking, Printing document, Creating a Table Using the Table Menu and table formatting, Borders and Shading, Templates and Wizards, Mail Merge, importing, exporting and inserting files, formatting pages, paragraphs and sections, indents and outdents, creating lists and numbering, Headings, styles, fonts and font size Editing, positioning and viewing texts, Finding and replacing text, inserting page breaks, page numbers , book marks, symbols and dates.

3. Presentation Software using Microsoft Office

Power point elements, Templates, Wizards, Views, Exploring Power Point Menu, Working with Dialog Boxes, Adding Text, Adding Title, Moving Text Area, Resizing Text Boxes, Adding Art, Starting a New Slide, Starting Slide Show, Saving presentation; Printing Slides, Views (View slide sorter view, notes view, outlines view) Formatting and enhancing text formatting, Creating Graphs (Displaying slide show and adding multi – media)

4. Spreadsheet using Microsoft Office

Elements of Electronics Spread Sheet and Ms-Exc
el: Opening of Spread Sheet, menu bar, Creation of cells and addressing of cells, Cell inputting.
Manipulation of cells: Enter texts numbers and dates, Creation of tables, Cell Height and Widths, Copying of cells.
Functions: Using functions: mathematical, statistical and financial function.
Spread sheets for Small accountings: Maintaining invoices/budgets, Totaling of various transactions, maintaining daily and monthly sales reports.
Charts: drawing different types of charts.

PAPER – 3: ELECTRONIC DEVICES AND COMPONENTS

Time: 3 hours **M. Marks: 100**
Theory: 60
Practical 40

THEORY

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

INTRODUCTION: Classification of materials into conducting and insulating materials through a brief reference to atomic structure, Conducting Materials, Insulating Materials, Semi-conductor Materials

ACTIVE AND PASSIVE COMPONENTS: Introduction to active and passive components; fixed and variable resistances their various types, fixed and variable capacitors, their various types and important specifications and colour codes.

SECTION-B

Voltage and current sources – concept of constant voltages and constant current sources, symbol and graphical representation, characteristics of ideal and practical sources, LDR.

Semiconductor Diode: Atomic structure of Germanium and Silicon semi-conductors; intrinsic and extrinsic semiconductors, PN junction, basic principles of operation and VI characteristics of PN junction diode, static and dynamic resistance of a diode.

SECTION-C

Use of a diode in rectifiers, half wave, full wave and bridge rectifier with shunt capacitor filter, series inductor filter, zener diode and its applications, as a voltage regulator, light emitting diode (LED), liquid crystal display (LCD).

SECTION-D

TRANSISTOR : Introduction to a transistor, working of a PNP and NPN transistor, input and output characteristics, transistor configurations, biasing of a transistor, amplifying action of a transistor, brief comparison of different configurations, field effect transistor FET, JFET, MOSFET, their characteristics and applications.

PRACTICAL

1. Study of VI characteristics of PN junction
2. Study of Half wave, full wave & Bridge rectifiers.
3. Study of simple capacitive, T & II filters.
4. Study of zener as a voltage regulator.
5. Study of transistor characteristics in CC, CB and CE configuration
6. Study of FET Characteristics
7. Study of MOSFET Characteristics

References Books:

1. Integrated Electronics, Millman, and Halkias, Tata Mcgraw Hill, 2007.
2. Electronic Devices & Circuits Theory by Boylested, Pearson Education.
3. Electronic Fundamentals & Application, by J.D. Ryder, PHI.
4. Electronic Devices, by Floyd, Pearson Education.
5. Electronics Devices & Circuits by J.B.Gupta, KATSON

PAPER – 4: BASICS OF ELECTRICAL ENGINEERING

Time: 3 Hours **M. Marks: 100**
Theory: 60
Practical 40

THEORY

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

DC Circuits : Concepts of electricity, Definition and units of following terms, Potential and potential difference; Current; Resistance, Electrical Power; Electrical Energy, Ohm's law and its practical applications, Effect of temperature on resistance, Connection of resistance in series and parallel, Kirchoff's laws and their applications to simple circuits

SECTION-B

AC Fundamentals: Difference between ac and dc, Terms related with ac waves, RMS and average values of sinusoidal waves, phase and phase difference, Representation of sinusoidal quantities by means of phasors, Alternating voltage applied to pure resistance, Alternating voltage applied to pure inductance, Alternating voltage applied to pure capacitance, R-L series circuit, R-C series circuit, Impedance triangle, Power and power factor in ac circuits

SECTION-C

Electromagnetic Induction: Concept of magnetic field, Concept of magnetic flux, reluctance, mmf, permeability, Faraday's law, self and mutual induction
Electrical Machines: Construction and working principle of transformer and single phase motor.

SECTION-D

Electrical Safety: Precautions while working with electricity, Electric shock, effect of electric shock and precautions against shock, Treatment of electric shock. Safety devices such as fuse, relay and MCB. Introduction to earthing and grounding
Electric Cables & Batteries: Different type of electrical cables and their Specifications. Types of wires & cables, standard wire gauge (SWG). Classification of cables according to gauge (core size), number of conductors, material, insulation strength, flexibility etc. Types and Construction of batteries, common fault in batteries and their remedies.

PRACTICAL

1. To verify Ohm's Law
2. To verify KVL & KCL
3. Study of construction of Motors & Generators
4. Measurements of Electrical Quantities – Voltage, Current, Power and Power Factor in RLC Circuit
5. Measurement of impendence in RL, RC and RLC circuits and study of resonance phenomenon
6. Measurement of active and reactive power in single phase A.C. Circuit
7. Measurement of power & power factor in a single phase AC circuit using three Ammeter Method
8. Perform load test on a single phase transformer

Recommended Books:

1. Principles of Electrical Engineering by Gupta BR; S. Chand and Company, New Delhi.
2. Basic Electrical Engineering by S.K. Sahdev, Pearnson Education
3. Electrical Machines by Bhattacharya SK; Tata McGraw Hill, Delhi.
4. Experiments in Basic Electrical Engineering by Bhattacharya SK and Rastogi KM; New Age International, New Delhi.
5. Experiments in Electrical Engineering by Bhatnagar US; Asia Publishing House, Bombay.
6. Advanced Electrical Technology by Cotton H; Isaac Pitmans and Sons Limited, London.
7. Basic Electrical Engineering by J.B. Gupta, Katson.
8. Basic Electrical Engineering by T.K. Naggarkar & Ms. Sakhija Seventh Edition 2008, Oxford University Press.

Diploma Course in Maintenance of Electronics Instruments (Full Time) (Semester – I)

PAPER – 5: ELECTRONIC MEASUREMENTS & INSTRUMENTATION

Time: 3 Hours **M. Marks: 100**
Theory: 60
Practical 40

THEORY

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

INTRODUCTION: Accuracy precision, sensitivity, static errors, range, span, repeatability linearity, hysteresis, types of errors, dynamic response, loading effect.
BASIC INDICATING INSTRUMENTS: Classification of instruments, Introduction to moving iron and moving coil instruments, dc ammeter, dc voltmeter, ac ammeter, ac voltmeter, ohm meter and analog multi-meter.

SECTION-B

CATHODE RAY OSCILLOSCOPE: Introduction to CRO**,** basic CRO circuit, measurement of voltage, current, phase, frequency, time period dual trace oscilloscope, specifications of a CRO and their significance, front panel controls.

SECTION-C

DIGITAL INSTRUMENTS: Block diagram, principle of operation and use of LCR meter, frequency meter, and digital multi-meter. Digital Storage Oscilloscope (DSO).
SIGNAL GENERATORS: Standard Signal Generators, Square Wave Generators, Function Generators, Spectrum Analyser: Waveforms, block diagrams and controls.

SECTION-D

TRANSDUCERS: Introduction to transducers and its classification, LVDT, strain gauge, thermistor, thermocouple and capacitive transducers

PRACTICAL

1. Measurement of various electrical quantities using of multi-meter, voltmeter and ammeter.
2. Measurement of voltage, current, phase, frequency, time period using CRO and DSO
3. Generation of different type of signals using Function Generator
4. Study and calibration of LVDT transducer for displacement measurement.
5. Calibration of capacitive transducer for angular displacement.
6. Calibration of strain gauge for temperature measurement.
7. Calibration of thermistor for temperature measurement.
8. Calibration of thermocouple for temperature measurement.

Recommended Books:

1. Electrical & electronic Measurement and Instrumentation by A.K. Sawhney.
2. Basic Electrical Measurement by B. Shout.
3. Electronic Instrumentation and Measurement techniques by W.D. Cooper.

PAPER – 6: ELECTRONICS WORKSHOP

Time: 3 hours **M. Marks: 50**
Practical 50

PRACTICAL

1. To study and practice various Electrical and Electronics symbols and safety guidelines.
2. To make use of various tools, equipment and instruments to be used in Electrical /Electronic Workshop such as Spanners, Screw Drivers, Files, Wire stripper, Soldering iron, Desoldering pump, Tweezers, Multimeter, CRO, Function Generator etc .
3. (a)To design a distribution board with four outgoing circuits for fan and light load along with main switch and fuses.

   (b) Layout of complete house wiring with batten wiring or plastic casing and capping with light, tube and lamp.
4. Assembly of distribution board/panel using MCB, main switch, changeover switch and ELCB.
5. (a) Soldering electronic elements with the necessary switches, micro-switches and extension terminals. (b) Wiring of series test lamp board and to use it for finding out circuit faults.
6. Testing and rectification of faults in common electrical appliances such as electric iron, electric kettle, ceiling fan and electric geyser.
7. To do the identification, study and testing of various electronic components viz various types of (a) Resistors (b) Capacitors (c) Inductors (d) Diodes (e) Transistors (f) Thyristors (g) ICs (Linear & Digital) etc..

Diploma Course in Maintenance of Electronics Instruments (Full Time) (Semester – II)

PAPER – 7: COMMUNICATION SKILLS-II

Time: 3 Hours **M. Marks: 100**
Theory: 40
Practical 60

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
Instructions: for Practical Exam: Entire syllabus will be covered for practical.

SECTION-A

Reading Skills:

1. News paper reading skills
2. Content reading through internet sources
3. Comprehension Passages

SECTION-B

Listening Skills:

1. Receiving voice calls
2. Attending active phone calls and responding
3. Daily news listening exercises (Audio and Video)
4. Note taking
5. Listening to native speakers conversations.

SECTION-C

Common Mistakes:

1. How to avoid common mistakes in: Nouns, Pronouns, Adjectives, Adverbs, Prepositions, word usage, helping verbs, verbs, phrases, clauses and sentences

Foreign Words:

1. Frequently used foreign words.

SECTION-D

Advertsement Writing:
Classified, Display, Boxed, Billboard, Online

Suggested Readings/ Books:

1. KK Ramchandran, et al Business Communication, Macmillan, New Delhi
2. Swati Samantaray, Business Communication and Communicative English, Sultan Chand, New Delhi.
3. S.P. Dhanavel English and Communication Skills for Students of Science and Engineering (with audio CD)
4. Computer Mediated Communication 1st Edition by Crispin Thurlow (Lara Martin Lengel , Alice Tomic.
5. Collins, Patrick. Speak with Power and Confidence. New York: Sterling, 2009.
6. Fitikides, T. J. Common Mistakes in English. London: Orient Longman.

PAPER – 7: COMMUNICATION SKILLS-II

(PRACTICAL)

Instructions for Practical Exam: Entire syllabus will be covered for practical.

1. Receiving voice calls
2. Attending active phone calls and responding
3. Daily news listening exercises (Audio and Video)
4. Note taking
5. Listening to native speakers conversations.
6. Advertisements Writing
7. Frequently used foreign words.

Diploma Course in Maintenance of Electronics Instruments (Full Time) (Semester – II)

PAPER – 8: COMPUTER FUNDAMENTALS-II

Time : 3 Hours **M. Marks 100**
Theory: 40
Practical 60

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
Instructions: for Practical Exam: Entire syllabus will be covered for practical.

SECTION-A

Introduction to networks: Network Definition, Basic Components of a Network, Network types and topologies, Uses of Computer Networks, Network Architecture.
Transmission Media: Coaxial cable, twisted pair cable, fiber optics & satellites. OSI reference model, TCP/IP reference model, comparison of OSI and TCP reference model.
Computer Communication
Basic of Computer networks: LAN, WAN, MAN.
Internet: Introduction to internet and its application/services.
Service on Internet: WWW and web-sites, Electronic mails, Communication on Internet.

SECTION-B

Web Browsers: Internet Explorer, Chrome and Firefox
Surfing the Internet: Giving the URL address, Search, Moving Around in a web-site, Printing or saving portion of web pages, down loading/uploading
Chatting on Internet
Email: Basic of electronic mail, Creating Email id, Mailbox: Inbox and outbox. Using Emails: Viewing an email, sending an Email, Saving mails, sending same mail to various users, Document handling: Sending soft copy as attachment, Enclosures to email, sending a Portion of document as email

SECTION-C

Tally:
Introduction to financial accounting: accounting concepts.
Financial accounting basics: company creation, accounts configuration, accounts classification, accounts master, creations of voucher, types and classes, accounts vouchers.
Financial accounting advanced: final accounts, bank reconciliation statement

SECTION-D

Inventory: introduction to inventory, stock groups, stock categories, stock item, reorder levels, locations / go downs, units of measure, price list, tariff classification, dealer excise, opening stock, pure inventory voucher, entry of pure inventory voucher, bill of material, purchase and sales order, foreign exchange transactions.

Business Management: New Year books, MIS reports, budget management, scenario management.

Reference Books:

1. Tanenbaum A. S., “Computer Networks”, PHI.
2. TALLY ERP 9 TRAINING GUIDE - 4TH REVISED & UPDATED EDITION – 2018by Asok K. Nadhan

Diploma Course in Maintenance of Electronics Instruments (Full Time) (Semester – II)

PAPER – 8: Computer Fundamentals-II

(PRACTICAL)

Instructions for Practical Exam: Entire syllabus will be covered for practical.

1. Network types and topologies.
2. Electronic mails.
3. Communication on Internet.
4. Surfing the Internet: Giving the URL address, Search, Moving Around in a web-site, Printing or saving portion of web pages, down loading/uploading
5. Chatting on Internet
6. Introduction to financial accounting: accounting concepts.
7. Financial accounting basics: company creation, accounts configuration, accounts classification, accounts master, creations of voucher, types and classes, accounts vouchers.
8. Financial accounting advanced: final accounts, bank reconciliation statement
9. Inventory: introduction to inventory, stock groups, stock categories, stock item, reorder levels, locations / go downs, units of measure, price list, tariff classification, dealer excise, opening stock, pure inventory voucher, entry of pure inventory voucher, bill of material, purchase and sales order, foreign exchange transactions.
10. Business management: New Year books, MIS reports, budget management, scenario management.

Diploma Course in Maintenance of Electronics Instruments (Full Time) (Semester – II)

PAPER – 9: ELECTRONIC CIRCUITS & IC

Time: 3 hours **M. Marks: 100**
Theory: 60
Practical 40

THEORY

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

SMALL SIGNAL AMPLIFIERS: Introduction, Single stage transistor amplifier, Frequency response of single stage amplifier,3-dB points, Bandwidth of an amplifier, Cascading of an amplifier, Resistance – capacitance coupling, Transformer coupling, Direct coupling.

POWER AMPLIFIERS: Classification of amplifier, Need for power amplifier, Difference between power and voltage amplifier, Concept of distortions in power amplifiers, Class B Push-pull amplifier circuits.

SECTION-B

FEEDBACK AMPLIFIERS & OSCILLATORS: Concept of feedback in amplifiers with block diagrams, Types of feedback, Voltage gain of feedback amplifier, Negative feedback and its advantages. Conditions for oscillation, Principles of operation of Wein bridge oscillator and types of oscillators.

SECTION-C

INTEGRATED CIRCUITS (ICS) : Definition, Advantages of ICs over discrete components, Integration Types – SSI, MSI, LSI, Classification- Monolithic and hybrid
OPERATIONAL AMPLIFIERS: Characteristics Ideal, inverting, non-inverting inputs virtual ground, Applications, Inverting, non-inverting amplifier Comparator, Inverter, Adder, Subtractor, Phase shifter, differentiator, integrator.

SECTION-D

555 TIMER & IC REGULATORS: Simple Block Diagram, Pin configuration, 555 as a Mono stable and Astable Multi-vibrator. IC Regulators: 723, 78 and 79 series, pin configuration and use in power supply.

PRACTICAL

1. To study the performance characteristics of phase shift oscillator and to determine the frequency of oscillation
2. To study the performance characteristics of Hartley oscillator and to determine the frequency of oscillation
3. Study of frequency response of RC coupled amplifier.
4. Study of Class A/B Transformer coupled power amplifier.
5. To use Op amp as Inverter, adder, subtractor, differentiator and integrator and to study its response.
6. Design a delay circuit using 555 timer
7. Design a power supply (on PCB as well as bread board) using 78XX and 79XX ICs

Recommended Books:

1. Electronic Devices and Circuit Theory, Boylestad R.L. VIII Edition, Pearson Education, 2008.
2. Electronic Devices and Circuits by J.B. Gupta, Katson.
3. Op–Amps & Linear Integrated Circuits: Ramakant A. Gayakward, Pearson Education
4. Operational Amplifiers with Linear Integrated Circuits: Fourth Edition, William D. Stanley
5. Micro Electronics : Millman & Grabal, Tata Mc-Graw Hill

PAPER – 10: ELEMENTS OF DIGITAL ELECTRONICS

Time: 3 Hours **M. Marks: 100**
Theory: 60
Practical 40

THEORY

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

INTRODUCTION: Basic difference between analog and digital signal, Applications and advantages of digital signals.
NUMBER SYSTEM: Binary and hexadecimal number system: conversion from decimal, octal and hexadecimal to binary and vice versa. BCD representation, Binary addition, subtraction and 1's & 2's complement method of subtraction.

SECTION-B

LOGIC GATES: Concept of negative and positive logic, Definition, symbols and truth table of NOT, AND, OR NAND, NOR XOR Gates. NAND and NOR as universal gates.
Combinational Logic Circuits: Half adder. Full Adder. Half Subtractor, Full Subtractor, comparator, multiplexer and demultiplexer

SECTION-C

LATCHES AND FLIP FLOPS : Concept and types of latches with their working and applications, Operation using waveforms and truth tables of RS, T, D,JK, Master/Slave JK flip flops, Difference between a latch and a flip flop.

COUNTERS: Binary counters, Divide by N ripple counters, decade counter, Down counters, up/down counter, Synchronous counters (only introduction), Difference between Asynchronous and Synchronous counters.

SECTION-D

Microprocessor: Introduction to micro-processor, architecture of 8-bit microprocessor, memories related to micro-processor, Introduction to microcontroller.

PRACTICAL

1. Verification of the truth tables of logic gates, e.g., 7400, 7402, 7404, 7408, 7432, 7486.
2. Verification of the truth table of the Multiplexer 74150.
3. Verification of the truth table of the De–Multiplexer 74154.
4. Design and verification of the truth tables of half adder and full adder circuits using gates 7483.
5. Design and test of an S.R. flip–flop using NOR/Nand gates.
6. Verify the truth table of a J–K flip flop (7476).
7. Verify the truth table of a D flip–flop (7474)
8. Operate the counters 7490, 7493 and 74192. Verify the frequency division at each stage. With a low frequency clock (say 1 Hz display the count on LEDs).

Recommended Books:

1. Digital Principle and Applications by Mulvino and Leach, TMH
2. Modern Digital Electronics, R.P. Jain, PHI
3. Digital Electronics by B.R. Gupta, Katson

PAPER – 11: INDUSTRIAL ELECTRONICS

Time: 3 Hours **M. Marks: 100**
Theory: 60
Practical 40

THEORY

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

POWER DEVICES: Symbols, specifications and testing of SCRs, DIACS, TRIACS, Power Transistors, UJT. Characteristics of the above devices, Protection circuits for the above devices.

SECTION-B

CONVERTERS AND INVERTERS: Basic waveforms of single phase full wave mid-point and bridge circuit (both fully controlled and semi-controlled), Principle of chopper operation, classification and control strategies (only class and chopper), Principle of operation of inverters, Single phase inverter using thyristors.

SECTION-C

POWER SUPPLIES: Explanation of working of SMPS with the help of a Block diagram, Explanation of working of UPS with the help of a block diagram and topologies, Circuit explanation of battery chargers using thyristors.

SECTION-D

APPLICATION OF POWER DEVICES IN FABRICATION OF VARIOUS TYPES OF CONTROL CIRCUITS SUCH AS: Temperature Control, Illumination Control, Burglar Alarm Control, Electrical Heating and Welding Control, AC/DC Drive Control.

PRACTICAL

1. To study the characteristics of SCR
2. To study the characteristics of DIAC
3. To study the characteristics of TRIAC
4. To study the characteristics of UJT and use of UJT as relaxation oscillator
5. To vary the frequency of an inverter circuit.
6. To vary the firing angle of an SCR using a phase shift circuit and a peaking transformer.
7. To vary the speed of a dc motor with the help of an SCR.
8. To determine the ripple factor of a full wave rectifier using SCR for various firing angles.

Recommended Books:

1. Power Electronics – P.C. Sen, Tata McGraw Hill Publishing Co. Ltd., 2007.
2. Power Electronics and Control– S.K. Dutta, Prentice Hall of India Pvt. Ltd., 2006.
3. Industrial Electronics SN Biswas Dhanpat Rai & Sons, 2005
4. Thyristor Engineering, MS Berde, Khanna Publication, 2005
5. Power Electronics, PS Bimbra, Khanna Publication, 2004

PAPER – 12: CONSUMER ELECTRONICS

Time: 3 Hours **M. Marks: 100**
Theory: 60
Practical 40

THEORY

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

AUDIO SYSTEMS: Microphones: Construction, working principles and applications of microphone: carbon, moving coil, crystal, condenser type.
Loud Speakers: Direct radiating, horn, loaded woofer, tweeter, mid-range, multi speaker system and baffles.

SECTION-B

PA Systems: Block diagram, setting up of PA system (general requirements, positioning of microphones and loudspeakers, indoors and outdoor installation of tape recorder),

SECTION-C

CD systems, Hi-Fi systems, pre-amplifiers, amplifiers, Stereo Amplifiers. Installation of Dish TV (general requirements, positioning of antenna) installation of CCTV camera.

SECTION-D

BASIC BLOCK DIAGRAM, WORKING PRINCIPLES AND APPLICATIONS OF THE FOLLOWING: Digital watch/clock: Calculator, Washing machine, Microwave ovens ,Electric oven ,Electronics Cordless telephone, Telephone Instruments, Fax machine, Photostat Machine, Mobile phone, VCD player, Digital Camera, Cellular phone.

PRACTICAL

1. To study CD/DVD player
2. To study mobile handset trainer
3. To study PA System
4. To study DTH TV
5. To study Close Circuit TV (CCTV)
6. To study telephone system
7. To study Microwave oven
8. To study Washing machines

Recommended Books:

1. Consumer Electronics by S P Bali, Pearson Education India
2. Consumer Electronics by B R Gupta, Katson

PAPER – 13: PROJECT

Time: 3 Hours **M. Marks: 50**
Practical 50

PRACTICAL

Students are required to design simple electronic circuits (Digital, Analog or mixed) as directed by the class teacher. Students should be made aware of the requirement and function of all the components used in the circuit from circuit designing point of view. An introduction about the different designing techniques used nowadays should also be given to the students of this subject.