

**Mahatma Gandhi Vidyamandir's
LOKNETE VYANKATRAO HIRAY ARTS, SCIENCE AND
COMMERCE COLLEGE,
PANCHAVATI, NASHIK
DEPARTMENT OF ELECTRONIC SCIENCE**

**Diploma in Electrical and Electronics Devices Repairing
(A Vocational Diploma Course under the Community College
Scheme of UGC, New Delhi)**

(To be implemented from Academic Year 2019-2020)

Title of the Course:**One Year Diploma in Electrical and Electronics Devices Repairing
(To be implemented from Academic Year 2019-2020)**

(A Vocational Diploma Course under the Community College Scheme of UGC, New Delhi)

Preamble:

The systematic and planned curricula aimed at focusing attention to the skills required for practicing the subject of Electrical and Electronics Devices Repairing. This is expected to make the student become more confident in working and shall motivate and encourage the student for pursuing higher studies in this area for becoming self-employed and for becoming an entrepreneur.

Introduction:

During first semester, the basic topics related to the analog and digital electronics, computer fundamentals, measurement equipment, maintenance concepts, electronic system building blocks, components, assembly techniques are dealt with. The practical course is designed to emphasize practical skills required for circuit building, testing and trouble-shooting.

During second semester, the level of the theory and practical courses shall be one step ahead of the first semester. Proportionate number of laboratory exercises will be included in the laboratory course.

Aim of the Course:

DEEDR forms the basis of all other fields. We will come to know the construction and working of all electrical equipments and thus all about electricity. Thus Diploma holders can be employed in electrical electronics based industries, business, and entrepreneurship as well as in software companies.

Objectives:

- To provide in-depth knowledge of technological aspects of electronics
- To familiarize with current and recent technological developments
- To enrich knowledge through programmes such as industrial visits, hobby projects, market survey, projects etc.
- To train students in skills related to electronics industry and market.
- To create foundation for perfecting practical skills in Electronics
- To develop analytical abilities towards real world problems
- To help students build-up a progressive and successful career in Electronics

Course duration:

The Course for the Diploma in Electrical and Electronics Devices Repairing is of one academic year, consisting of 02 semesters.

Eligibility:

Passed 12th Arts/Commerce/science/Vocational/Technical stream or its equivalent Examination (or) 10th + (2 years I.T.I) with appropriate specialization.

Note:

Admissions will be given as per the selection procedure / policies adopted by the college, in accordance with conditions laid down by the Community College under the UGC New Delhi Scheme of Vocationalization. Reservation and relaxation will be as per the Government rules.

Course Structure:**Duration:** The duration of Diploma course shall be one year.**a) Compulsory Papers:** All Theory and Practical Papers**b) Optional Papers:** Nil**c) Question Papers:****Theory paper:**

Internal Examination – 50 marks (at the end of each semester)

External Examination – 50 marks (at the end of each semester)

Practical Paper:

Internal Examination – 75 marks (at the end of each semester)

External Examination – 75 marks (at the end of each semester)

d) Medium of Instruction: The medium of instruction for the course shall be **English**.**e) Terms:**

Dates for commencement and conclusion for the first and second semesters will be declared by the college authorities. Terms can be kept by only duly admitted students. The term shall be granted only on minimum 75 percent attendance at theory and practical course and satisfactory performance during the term.

Titles of Papers and Scheme of Study Evaluation

Sem	Paper	Paper Code	Paper Title	Credits	Lectures/Week		Evaluation		
					Theory	Practical	CA	UE	Total
I	DT11	DEED1 1	Electronic Components, Circuits and Equipment Assembly	4	4	-	50	50	100
	DT12	DEED1 2	Measurement Parameters and Tools	4	4	-	50	50	100
	DT13	DEED1 3	Computer Fundamentals	4	4	-	50	50	100
	DP11	DEED1 4	Practical Course-I	6	-	6	75	75	150
	DP12	DEED1 5	Practical Course-II	6	-	6	75	75	150
	DP13	DEED1 6	Practical Course-III	6	-	6	75	75	150
II	DT21	DEED2 1	Installation, repair and maintenance of Electrical Home appliances - Power Supply, inverter and UPS,	4	4	-	50	50	100
	DT22	DEED2 2	Installation, repair and maintenance of Electronics Home appliances-communication equipment	4	4	-	50	50	100
	DT23	DEED2 3	Computer hardware assembly/ installation	4	4	-	50	50	100
	DP21	DEED2 4	Practical Course-I	6	-	6	75	75	150
	DP22	DEED2 5	Practical Course-II	6	-	6	75	75	150
	DP23	DEED2 6	Practical Course-III	6	-	6	75	75	150

Semester- I

PAPER I: DEED11- Electronic Components, Circuit and Equipment Assembly

Unit 1: Passive Components, accessories and tools [14 L]

Resistor, capacitor, inductors, AF transformers, IF transformers, switches, connectors, relays, solenoids, visual identification and color codes, device marking schemes and interpretation of information printed on the body of devices.

Motors (DC), contactor, circuit breakers, Fuses, MCB, ELCB

Connectors and jacks in PC, Cellphone, still camera, video Camera, Car audio/video system, Home audio/video system.

Electrochemical cells – Chargeable, nonrechargeable, AA, AAA, Button, Cellphone battery, Typical voltages, Amp-Hour rating, precautions during use and disposal.

Tools: Screw-drivers, Allen key, automatic centre punch, files, cutters, pliers, wire-strippers, hacksaw, soft tools (chemicals for electronics).

Unit 2: Semiconductor Devices [12 L]

semiconductor device- PN junction, diodes, transistors, FETs, MOSFETs, DIAC, TRIAC, data sheets, absolute maximum rating, reading of data sheets, packages and lead information, causes and indications of failure

Displays - LEDs, LCDs, 7-segment, dot matrix, bar graph, LEDs for lighting.

Unit 3: Drawings, Soldering and Desoldering Techniques [10 L]

Circuit symbols, standards, circuit diagram, front and rear panel,

Solder joint, dry solder joint, cold solder joint, Good and bad solder, solder material soldering tools, soldering gun, soldering station, ultrasonic soldering station soldering techniques, tools for desoldering, desoldering techniques, testing of soldering joints, Precautions during soldering and desoldering.

Unit 4: Electrical wiring, Equipment enclosures and Cabinets [12 L]

Types of Wires, Gauges, Selection of wires, Types of cables, UTP, STP, Armoured, flat ribbon type etc with examples of common applications e.g. cables in a PC, safe voltage and current ranges, Colour conventions, Wire harnessing.

Typical Simple Household Wiring, Wiring of tube light, switchboard wiring, stair case wiring, fan regulator and fan wiring, Power cable wiring, grounding and shielding, Earthing – necessity and methods. Electric shock and precautions.

Enclosure Types: Cabinet racks (incl. NEMA 12), Server racks, Co-location racks, Open racks (Large open racks, table-top racks, swing-frame, relay racks), Wall mount cabinets Rack mount enclosures, Card racks, Portable cabinets, Chassis, Small metal enclosures, Cast metal enclosures, Plastic boxes, NEMA 4x enclosures

Recommended Books:

1. Student Reference Manual for Electronic Instrumentation Laboratories by Stanley Wolf, and Richard F.M. Smith, Prentice Hall of India Pvt. Ltd. New Delhi
2. Electronics Shop Practices, Equipment and Materials By Clyde N. Herrick, Prentice Hall Inc
3. Electronic Instruments and Systems: Principles, Maintenance and Troubleshooting by R. G. Gupta Tata McGraw Hill Edition 2001
4. Modern Electronic Equipment: Troubleshooting, Repair and Maintenance by Khandpur, TMH
5. Electronic Instrumentation and Measurement Techniques by WD Cooper, AD Helfrick, Prentice Hall of India Pvt. Ltd. New Delhi
6. Electronic Testing and Fault Diagnosis by G. C. Loveday, A. H. Wheeler Publishing
7. Art of Electronics by Horowitz and Hill, Cambridge University Press

PAPER II: Measurement Concepts and Instruments

Unit 1: Basic Measurement Systems and Tools [10 L]

Electrical and physical quantities with their units. Electrical shocks and procedure for separating person from contact with live wire First Aid against electrical hazards, Different methods of artificial respiration, Electric fire, Fire Extinguishers.

Identify & use all hand tools: Pliers, Combination, files, side cutting, round nose, 10 long nose, 29 Screw drivers, Allen key, connectors, electrical knife, wire-strippers, Neon tester, test lamp, series test lamp, pincer, line dori, plumb bob, steel rule, Tenor saw, Hacksaw, Hammer, soft tools (chemicals for electronics). Symbols uses in Electrical technology Reading of electrical drawing.

Switch, fuse, line tester, electronic line tester, series test lamp for single phase, parallel test lamp for single phase, series test lamp for three phase, parallel test lamp for 3 phase, thermostat, bimetallic relay, thermocouple, overload switch, electromagnetic relay.

Unit 2: Basic Meters [12 L]

Study of Construction, working principle, connections in circuit, interpretation of information printed on the body of the meter, standard operating method and safety precaution and simple indicative.

PMMC movement, dc ammeter and dc voltmeter, ohmmeter, Resistance of moving coil, resistance of ammeter, of voltmeter, AC ammeter and voltmeter, Analog multi-meter, Digital Voltmeter, Digital Multimeter, Concept of auto ranging, Megger, Conditions under which a meter may be damaged, preventive measures

Unit 3: Measuring Instruments [14 L]

Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative, Analog Cathode Ray Oscilloscope, Digital Storage Oscilloscope (DSO), DFM –universal timer/counter, Front panel – controls, selector switches, terminal connectors and setup procedure for typical measurements, accessories and cables, Analog versus Digital Instruments.

Unit 4: Test Instruments [12 L]

Study of Block Diagram, working Principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution of -

AF signal generator, RF signal generator, Pulse generator, Function generator, DC power supply (linear & switch mode)

Recommended Books:

1. Electronic Instruments and Systems: Principles, Maintenance and Troubleshooting by R. G. Gupta Tata McGraw Hill Edition 2001
2. Student Reference Manual for Electronic Instrumentation Laboratories by Stanley Wolf, and Richard F.M. Smith, Prentice Hall of India Pvt. Ltd. New Delhi
3. Electronic Instrumentation and Measurement Techniques by WD Cooper, AD Helfrick, Prentice Hall of India Pvt. Ltd. New Delhi
4. Digital Instrumentation A. J. Bouwens, Tata McGraw Hill
5. Consumer Electronics by S. P. Bali, Pearson
6. Modern Electronic Equipment: Troubleshooting, Repair and Maintenance by Khandpur, TMH
7. Electronic Testing and Fault Diagnosis by G. C. Loveday, A. H. Wheeler Publishing

Paper-III: DEED13: Computer Fundamentals

Unit 1: Computer Fundamentals

Functional Block Diagram, History, Evolution, and CPU Cabinet: Power supply, SMPS, Motherboard, CPU, Cables and connectors, Main and auxiliary memory, Front and rear panel study. Input devices: wired/ wireless Keyboard, Mouse, Joystick, Scanner, Digitizers, Light pen, Touch screen, Barcode Scanner Camcorder. Output devices: Monitor (CRT, LCD/ LED Panel,) Printer: Dot Matrix, Inkjet, LASER, Thermal, Plotter, Bar code Printers, Sound devices (Speaker, Headphone, Bluetooth, and dongle).

Advanced Technology in Computers: - Server, client, Mainframe, Desktop, Notebook, Tablets etc

Interfaces: HDC, CRT Controller, Serial and Parallel Interface, UART, USB, RS-232, introduction to Bluetooth devices, Wi-Fi, HDMI, Mini USB, Micro USB.

Unit 2: Computer Memory and Memory Management Techniques

Types and characteristics, Classification, Semiconductor, Magnetic, Optical ROM and its types. RAM and its types: SDRAM, EDORAM, DDR Series, Flash RAM. Memory modules, SIMM and DIMMs, Secondary Memory: Hard Disc Drive, Floppy Disc, CDROM, CD R/W, DVD, Pen Drive, flash memories: Mini/micro SD Card. Formatting and Utility Tools for drivers.

Unit 3: Operating System:

Types and Functions, DOS – Introduction, Versions, DOS Commands, Internal, External, Root Directory. Windows – Introduction, Working with desktop, Control Panel settings. Introduction to RTO, LINUX: Basic Commands, Introduction to PHABLET and their OS: ANDROID OS, IOS.

Unit 4: An Overview of Networking, Internet & Multimedia

Networking: Concepts, Need, Types, Topologies, Protocols, Introduction to Network Interface Card and Network Operating Systems, Thick and Thin PC's, Virtual PC.

Multimedia: Medium concept, Types, Multimedia Computer Systems. Internet: Concept, Different Connection types, Applications.

References:

1. Upgrading and Repairing of PCs, Scott Muller, Que (2014)
2. IBM PC and Clones: Hardware, troubleshooting and maintenance, B. Govindarajalu, Tata Mac Graw Hill (2008)
3. Computer Motherboard Testing and Fault finding, S. K. Gupta
4. A+ guide to PC hardware maintenance and repair, Michael Graves, Thompson (2015)
5. Computer Hardware: Barry Blundell, Thompson (2008)

SEMESTER - I
Practical Paper –I: Electronic Components, Circuit and Equipment Assembly

List of Practical's (Minimum 08, 4 from each group):

Group A	Test and Measuring instruments: Connection in circuits, using all modes and precautions therein (use of Operating instructions manual is mandatory)
1	Simpson 260 or equivalent analog multimeter
2	Digital multimeter with variety of ranges
3	Cathode Ray Oscilloscope/Signal Generator/Power Supply
Group B	Terminal identification and functional checking using multimeter (use of Operating instructions manual / component datasheet is mandatory)
4	Rheostat, Potentiometer And Switches, EM Relay, Transformer, Auto- Transformer (Dimmerstat),Fuses
5	Diode, Zener, Transistor (At least 3 different packages each) and LEDs(different wattages and colours), LED strips, Neon indicator lamp
6	DC Sources: Battery (5 Different types), Solar PV cell, Battery Eliminator, CVCC Power Supply.
Group C	Soldering and desoldering
7	Soldering and Desoldering of Components from given PCB
Group D	Electrical Wiring (including drawing schematic), Home appliances (Schematic, Identification of parts, disassembly and assembly)
8	Tube light testing
9	Switch board wiring
10	Electric iron (semi automatic or fully automatic)
Group E	Power line protection devices and gadget (Schematic, Identification of parts, disassembly and assembly)
11	MCB, ELCB (Demonstration of operation by creating test fault condition)
12	Spike protector
13	Home protector (tracing parts and sections)
Group F	Preventive Maintenance
14	PMMC/ Analog multimeter /Digital multimeter
15	Single Power Supply or Dual Power Supply

Group A, B, C, D experiments are compulsory. Any 2 experiment from Group E, any 2 experiment from Group F and any 2 experiment from Group G are to be performed.

- Safe working practice drill is desired on more than one occasion per term.
- Energy Audit of the laboratory in which students work be carried out by each student once in the year.
- In each experiment use of datasheet/operating instruction manual is mandatory.
- Hand tool practice exercise is desired as a preparatory exercise.

Note: These and any other equivalent experiments with a view to inculcating good, safe and disciplined work practices are desired.

Practical Paper –2 (DEEDP12):

The practical course consists of **15 experiments** out of which one will be activity equivalent to **2 practical** sessions. Activity will carry 15% marks at internal and external semester examination. Activity can be any one of the following:

Activity: Prepare and give a presentation after doing market survey using Power Point tools (comparative study) for the latest computer configuration.

List of Practicals:

1. Assignment type experiment: finding values of Electronic components like know the components- resistors from color code, capacitors, inductors and their types,
2. Assignment type experiment: finding values of Electronic components like cables, fuses, wires and
3. Assignment type experiment: finding values of Electronic e tools like stripper, cutter, soldering gun etc
4. Know your laboratory instruments: Signal Generators and CRO, DMM
5. Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative - Analog Cathode Ray Oscilloscope,
6. Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative- Digital Storage Oscilloscope (DSO),
7. Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative DFM –
8. Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative - universal timer/counter, Front panel – controls, selector switches, terminal connectors and setup procedure for typical measurements, accessories and cables,
9. Study of Block Diagram, working Principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution of - AF signal generator,
10. Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative - RF signal generator,
11. Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative - Pulse generator,
12. Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative - Function generator,
13. Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative DC power supply (linear mode)
14. Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative DC power supply (switch mode)
15. Study of Block Diagram, working principle, connections in circuit, interpretation of information printed on the body of the instrument, standard operating method and safety precaution and simple indicative- ups

Practical Paper – 3 (DEEDP13): Computer Fundamentals

The practical course consists of **10 experiments** out of which one will be activity equivalent to **2 practical** sessions. Activity will carry 15% marks at internal and external semester examination. Activity can be any one of the following:

Activity

- 1) Prepare and give a presentation after doing market survey using Power Point tools (comparative study) for the latest computer configuration.
- 2) Technical Data survey of Computer Hardware and network tools.

Group A :(Minimum 4/6)

- 1) Control panel settings of windows operating system.
- 2) Desk top settings of windows operating system.
- 3) Computer Troubleshooting.
- 4) Identification and verification and Detailed Study of Disc drives.
- 5) Study of Power Supply: Types, Concepts of Fuse, MCB, Stabilizer, UPS, SMPS.
- 6) Study of computer networks & topologies.
7. Site Preparation, Electrical Connections and use of Maintenance kit, Cable Maintenance, Connecting Keyboard, Mouse, Printer, Scanner, Multimedia components and make it working.
8. Identification of system, Explanation of system components: Motherboard 1) Onboard controllers, 2) Add on controllers. (Drives, RAM, CMOS battery, SMPS, BIOS RAM, Chipset, Controllers, cables, connectors and tools.
9. PC Assembly / disassembly
10. Installation of OS and software

Group B: (Minimum 4/6)

- 1) Use of Internet, search engines and e-mail.
- 2) Setting IP addresses.
- 3) Installation of device drivers for Printer & Scanner.
- 4) Sharing files and folders.
- 5) Installation of Windows OS as a Desktop.
- 6) Installation of Linux OS as a Desktop.

SEMESTER - II

Paper-1: DEED21- Installation, Repair and Maintenance of Home appliances

Various Appliances and protection devices

Study of Block Diagram, working Principle, connections in circuit, interpretation of information printed on the body of the appliance, standard operating method and safety precaution and simple indicative - Digital Clock (watch), Microwave oven, Mixer, grinder, Roaster, Electric geyser, Electric iron, Telephone instrument, Headphone, Hearing aids, Electronic ignition system, Washing machine, Refrigerator induction cooker, Emergency lights, Circuit breakers, Home protector, spike protector, Stabilizers, Online UPS and Off Line UPS.

Note:

1. Tools and materials
2. Appliance diagrams
3. Installation procedures
4. Repair and maintenances tips
5. Troubleshooting steps

Reference:

1. DIY guide to appliances: Installing and maintaining your major appliances, Steve Willson, Creative Publishing international (2008)
2. Troubleshooting and repairing major appliances, Eric Kleinert, McGraw Hill professional (2012)
3. Consumer Electronics – Bali, Pearson Education (2014)

Paper-2: DEED22- Study of Different Power Plants

[Lectures-36]

Unit I

Introduction: Electrical energy demand and electrical energy growth in India, Electrical energy growth in India, Electrical energy sources, Fossil fuels and nuclear fuels, Present status of electrical demand

Unit II

Hydro Electric Power Plants: Selection of site, Advantages and disadvantages of hydro power plant, Hydrology, Classification based on- Water flow regulations, Load, Head, Element of hydro power plant and their functions- Dam, Storage reservoir, Fore bay, Surge tank, Pen stocks, Spill way, Head race and tailrace, Types of turbines, Specific speed, Brief idea about small and mini hydro plants, Pumped storage plant

Diesel Power Plants: Main components and working of diesel power plant with the help of block diagram, Advantage and disadvantage of diesel power plant, Application of diesel power plant, Principle and operation of gas turbine plants, Comparison of different power stations, Inter connection of power stations

Unit III

Nuclear Power Station: Introduction and selection of site, Block diagram of plant and its working, Main components and their function, Energy mass relationship, Energy due to fission and fusion, Nuclear chain reaction, Multiplication factor and critical size, Moderators materials, Fissile and fertile materials, Classification of Nuclear reactor, main parts and their functions, Safety measures required in nuclear plant, Disposal of nuclear waste

Thermal Power Station: Selection of plant location, Block diagram of plant and its working, Coal handling plant, Pulverising plant, Draft system, Boilers, Ash handling plant, Turbine, Different types of condensers, Cooling towers and ponds, Feed water heater, Economiser, Super heater and reheater, Air preheater

Unit IV

Solar, Wind and Ocean Energy: Application, Unit of solar power and solar energy, Historical review and future prospects, Schematic diagram of a solar thermal power plant, Solar central receiver thermal power plant, Solar pond thermal plant, Solar thermal power supply system for space station, Introduction to photo voltaic system, Merits and limitation of solar PV system, Principle of photo voltaic cell, Transparent, insulating and absorbing materials, Building heating by active and passive system, Solar still, solar dryer and solar cooker

Wind Energy- Introduction to wind energy, Merits and demerits of wind energy, Wind power and energy pattern factor, Wind machine, Horizontal axis wind machine, Vertical axis wind machine, Site selection of a wind machine, Application of a wind machine

Ocean Energy- Introduction to ocean energy, Types of ocean energy, Open cycle, Closed cycle

Unit V

Bio-Gas Energy: Introduction to bio-gas energy, Properties of bio-gas, Principle of bio-gas production, Chemical and microbiological processors, Factors which affects bio-gas production, Different feed stocks for bio-gas production, Classification of bio-gas plant- Fixed dome type, Floating type, Comparison between fixed dome and floating type bio-gas plant, Site selection of bio-gas plant, Bio gas lamp and chulha, Bio gas storage and transportation

Reference Books:

1. Generation of Electrical Energy B.R. Gupta
2. Power Plant Engg. Domkundwar
3. A course in Electrical Power Soni, Gupta, Bhatnagar
4. Energy technology S.Rao & B.B. Parulekar
5. Non-conventional Energy Sources A.N. Mathur & N.S.Rathore
6. Non-conventional Sources of D.M. Agrawal & S.K. Bhatnagar energy and appropriate technology
7. Non-conventional Energy Sources G.D.Rai
8. Solar Energy Garg & Prakash

Paper-3: DEED23- Entrepreneurship and Marketing Management

Unit I

Entrepreneurship: Role of entrepreneurship and its advantage, Classification of industries (based on scale), Classification of industries (based on type), New industrial policy, M.R.T.P. act, Product identification/selection, Site selection, Plant layout, Institutional support needed, Pre-market survey

Unit II

Entrepreneurship Support System: Role of District Industries Centre in setting up industry, Function of NSIC, SISI, NISIET, NRDC, SSIC, SIDO, NMTC, KVIC, RSMDC, Role of state finance corporation, state electricity board, pollution control board, RAJCON, BIS, I.S.O. etc.

Unit III

Principles of Management: Management, administration and organisation, difference between them, Scientific management: Meaning, characteristics, object and advantage: Taylor's scientific management – Fayol's principles of management, functions of management, Types of **Raw Material Management:** Allotment of iron and steel, coke/ coal, Allotment of other indigenous raw material from NSIC, Allotment of imported raw material and parts

Unit IV

Marketing Facilities: Supply of product to state govt, to defence, to railways, to CSPO, to CSD, Participation in international exhibition and fairs, trade centres, state emporium and departmental stores, Quality consciousness and its effect on product sales **Marketing Management:** Concept of Marketing, Problems of Marketing, Pricing policy, Distribution channels and methods of marketing

Unit V

Setting up SSI: Registration of SSI, Allotment of land by RIICO, Preparation of project report, Structure of organization, Building construction, Establishment of machines **Financial Sources for SSI:** Various institutions providing loans for industries, various types of loans, Subsidies

Reference Books:

- | | |
|--|---------------------------|
| 1. Hand Book of Small Scale Industry | P.M. Bhandari |
| 2. Hand Book on Entrepreneurship Development | O.P. Harkut |
| 3. Entrepreneurial Development | S.S. Khanka |
| 4. Statistical Quality Control | Mahohar Mahajan |
| 5. ISO: 9000 Quality System | S. Dalela |
| 6. Industrial Management | V.K. Sharma & O.P. Harkut |
| 7. Industrial Engg. & Management | O.P. Khanana |
| 8. Industrial Engg. & Management | T.R. Banga |

Practical Paper – 1 (DEED23): Maintenance of Home Appliances

- 1) Measure Current, Voltage and Resistance of Single Phase and Three phase load.
- 2) Assemble, connect and test the Electronic Choke and CFL assembly.
- 3) Identify the type of Resistor and determine the value of Resistance by colour code and also verify with Multimeter.
- 4) Verify the characteristics of series, parallel and its combination circuits.
- 5) Identify the phase, neutral and earth in single and three phase supply.
- 6) Prepare and solder electronic components on PCB as per diagram.
- 7) Test and troubleshoot of given assembled PCB.
- 8) Test, repair & overhaul the given ceiling fan
- 9) Test, service & repair the given table fan.
- 10) Service & repair of electric iron & geyser.
- 11) Service & repair of mixer.
- 12) Service & repair of washing machine
- 13) Check & replace thermostat & relay of refrigerator.
- 14) Service & repair of Microwave oven
- 15) Maintenance of batteries

Practical Paper-2: DEED22- Study of Different Power Plants

1. To study of modern steam power plant.
2. To Study about the Various Types of Fuel & Ash Handling Systems.
3. To study about different types of dust collectors and pulverized fuel burners.
- 4 .To study about nuclear power plant.
5. To study of different types of steam turbines.
6. To study about different types of condensers and cooling towers.
7. To study about economics of power generation systems.
8. To study of gas power plant.
9. To study of combined steam & gas turbine power plant.
10. Testing of diesel fired water tube boiler based steam power plant.

Practical Paper-3: DEED23- Entrepreneurship and Marketing Management

Project Report:

- Procedure of preparing a project report, Format of project report, Preparation of project report for some SSI items ownership, sole trading, partnership, joint stock, co-operative and public enterprise,
- Types of organisation, different types and their charts., Importance of human relation professional ethics,
- Need for leadership, leadership qualities, Motivation
- Prepare project report and give a presentation after doing market survey using Power Point tools