

DIPLOMA (ELECTRICAL) – PART FOUR

Optional Early Certificate: - Certificate (Electrical)

Syllabus:-

Sr. No.	Module Code	Name of Module	Credits	Total Marks
1	EE41-16	Electrical Engineering Design & Drawing-I	4	100
2	EE41-17	Computer Application for Engineering	4	100
3	EE41-18	Electrical Circuits & Analysis	4	100
4	EE41-19	Electrical Power	4	100
5	EE41-20	Electrical Machine	4	100

Module Name: Electrical Engineering Design & Drawing-I

- 1. Engineering Drawing and Importance of Drawing:** Drawing Board, Drawing Sheet Paper and Layout, Drawing Pins, U Chips and Cello Tape, T-Square, Set Square, Compass, French Curves, Templet, Divider, Protractor, Free Hand Sketch and Lettering.
- 2. Indian Electricity Rules and Specification:** Introduction, Specification.
- 3. Electrical and Electronics Symbols:** Common Symbols, Wiring, Switches, Socket Outlets, Lighting Fixtures, Electrical Appliances, Clock and Fire Alarms, Indicating Instruments, Semiconductor Devices, Transistors, Electron Tube.
- 4. Study of Hand Tools for Wiring:** Introduction, Hand Tools for Wiring.
- 5. Simple Household Circuits:** Simple Light Circuit, Staircase Circuit, Single and Double Staircase Circuit, Light and Fan Circuit.
- 6. Alarm circuit without and With Relays:** Circuit for Controlling one bell Using two push Buttons, Circuit for two Ordinary Bells, Bell Response Circuit for Three Rooms, Circuit for Traffic control at Road Crossings.
- 7. Orthographic Projections of Electrical Parts:** End Cover of an Induction Motor, Rotor of a Squirrel – cage Induction Motor, Motor Body Slip Rings, Pin – Type Insulator.

Module Name: Computer Application for Engineering

1. Information Storage and Retrieval

- Need for Information storage and retrieval.
- Creating database file.
- Querying database file on Single and Multiple Keys.
- Ordering the data on a selected key.
- Programming a very simple application.

2. Programming in 'C'

- Basic Structure of C Programs.
- Executing C programs.
- Constants, variables and Data Types.
- Operators and expressions.
- Managing Input-Output operations like reading a character, writing a character, formatted input, Output through Print, Scan getch, putch statements etc.
- Decision making and branching using IF.....else, switch go to statements.
- Decision Masking and looping using do-while and for statements.
- Array-one dimensional and two dimensional.
- File

3. Computer Application Overview

- Commercial and Business data Processing application.
- Engineering Computation.
- CAD, CAM, CAE, CAI

4. Typical Applications

- Use of Various application Software available in the field of Electronics Engineering.

Module Name: Electrical Circuits & Analysis

- 1. Basic Semiconductor and PN Junction Theory:** Conduction in Solid, p-Type and n-Type Semiconductor, pn Junction, drift Current, Reverse and Forward bias, Energy band in solids, Intrinsic and Extrinsic semiconductor, Electric Field, Junction breakdown mechanism, Diode as rectifiers.
- 2. Semiconductor Diodes:** Diode Characteristics and Parameters, Graphical Analysis of Diode Circuits, Rectification, Diode Logic Circuit and Frequency Response, Power dissipation in diode, diode clipping and clamping circuits.
- 3. Bipolar Junction Transistor:** Transistor Operation, Transistor currents, Common Base Common Emitter, Common Collector Characteristics, Transistor Voltage Amplification, T-Equivalent Circuit, r-Parameter, h-Parameter.

- 4. Transistor Biasing:** D.C Load Line and Bias Point, Fixed current Bias, Emitter Current bias, Comparison of Basic Bias Circuit, Thermal Stability, AC Bypassing, The AC load Line, Biasing transistor switching circuits.
- 5. Basic Transistor Circuit:** Common Emitter Circuit, Common Emitter h-Parameter Analysis, Common Collector Circuits, Comparison of CE, cc and CB Circuits.
- 6. Field Effect Transistor:** The n-Channel JEFT, Characteristics of an n-Channel JET, The p-Channel JEFT, FET Voltage Amplification, JEFT Construction, FET Equivalent Circuit, MOSFET Enhancement MOSFET, Power MOSFETs.

Module Name: Electrical Power

- 1. Transmission System:** Layout of transmission system, Constructional features of line, Electrical features of line, HVDC transmission lines.
- 2. Distribution System:** Layout of HT and LT distribution system, Construction of LT and HT undergone power cables, Estimation of LT and HT overhead distribution lines.
- 3. Sub Stations:** Brief Idea of substations, Layout of 33/11 KV distribution substation and various accessories and equipments, Estimation of 11KV/400 V pole mounted substation.
- 4. Faults:** Common type of faults in lines, Location and testing of faults in undergone lines, Maintenance schedule of lines.

Module Name: Electrical Machine

- 1. General Treatment of Electrical Machines:** Definition of Motor and generator, Torque due to alignment of fields and the concept of torque angle, Electromagnetic Force of an electrical machine.
- 2. DC Machines:** Main constructional features, Function of commutator for motoring and generating action, Factors determining induced emf, Trouble shooting on a dc motor.
- 3. Transformers (Single Phase):** Definition and principle, application, Constructional features of transformer, EMF Equation, Phasor diagram for a transformer on load, Voltage regulation and calculation.
- 4. Three Phase Transformers:** Construction of three phase transformers: Construction of three phase transformers, Type of three phase transformers, Difference between power and distribution transformers, Conditions for parallel operation, On load tap changer, Cooling of transformers, conservator, breather, bushing, temperature gauges etc.