# (ii)TRADE :ELECTRONICS

**PAPER-I**

**BASIC ELECTRONICS**

**THEORY**

**Time : 2 hrs**

**Theory : 30 Marks**
**CCE : 10 Marks**
**Practical : 50 Marks**
**Total : 90Marks**

### Basic Electricity

Electricity & its sources, AC and DC concept of Phase, Frequency, Graphical representation of AC and DC. Batteries, Need of power supply, Cells and Batteries. Charging & discharging of cell. Resistors, Capacitors Inductor and their types. Component ratings and color order of Resistors and Capacitor, Relationship between voltage and current. Ohm's law, Kirchhoff's Laws and their applications. Faraday's law.Magnetism, Definitions of Electromagnatization electromagnetic induction, flux, permeability.Transformers; concept working principle and application.

### Circuits

Series and Parallel combination of Resistors.Series and Parallel combination of Capacitors.Series, parallel combination circuits of resistors, capacitors and inductors, RC, RLC, LC circuits and their applications.

### Tools

Common Tools used in Servicing and Maintenance in Electronic Shop, Various Types of Soldering Iron proper use and maintenance, Desoldering Tools.

### Printed Circuit Board

PCB,Different Types of PCB-Single side PCB, Multipurpose PCB.

### Meter

Meter, Types of Meters-Deflection Meter, Recording Meter, Indicating Meter, Principle, Uses and Applications of Voltmeter, Ammeter and Multimeter.

## BASIC ELECTRONICS

**Time : 3 hrs** **PRACTICAL** **Marks : 50**

- Drawing of Electronic/Electrical Symbols.
- Freehand sketching of Electronic Components.
- Colour coding of resistors.
- Study and use of series and parallel Circuit of resistance.
- Study and use of series and parallel Circuit of Capacitor.
- Verification of Ohm's Law (Relationship between Voltage and Current).
- Verification of Kirchhoff's Laws.
- Verification of Faraday's Laws.
- Study of series and parallel Resonant circuits.
- Make series & parallel connection of batteries
- Study of series and parallel Resonant circuits.
- To check a transformer for primary and secondary voltages.
- Fabrication of an extension board for Power supply and use of Line Tester.

**PAPER-II** **ELECTRONICS CIRCUITS**

**THEORY**

**Time : 2 hrs**

**Theory : 30 Marks**
**CCE : 10 Marks**
**Practical : 50 Marks**
**Total : 90Marks**

## Semiconductor Physics

Atomic Structure, Conductors, Insulators, Semiconductors, P and N Type Materials, Their Principles and Properties, Diode and its working, Transistors, Working of Transistor, Zener Diode Symbols, Functioning and their properties.

## Rectifiers and Filters :

Rectifier, Half Wave, Full Wave and Bridge Types and their Working, Filters, Capacitors as a filters, Shunt capacitor filter, Series Inductor filter, T AND PIE Filter concept and working. Power Supply Regulators, Zener Regulation, Series and Shunt Regulator, Voltage Double and Triple circuits.

**Transistor as a Amplifiers :**

Transistor Biasing, Selection of operating point, Cut off Region, Active Region, Saturation Region, Transistor Configurations, Common Base Configuration, Common Emitter Configuration, Common Collector Configuration, Audio Amplifier, RF Amplifier

**Transistor as an Oscillator :**

Feedback, Positive Feedback, Negative Feedback, Sinusoidal Oscillator, Damped Oscillations, Undamped Oscillations, Oscillatory Tank Circuit, Positive feedback Amplifier as an Oscillator.

## ELECTRONICS CIRCUITS

**Time : 3 hrs** **PRACTICAL** **Marks : 50**

- Testing of Diode, Transistor and Zener Diode with the help of a Multimeter.
- Graded exercises on soldering practice viz. tinned wire, PCB, lugs, connectors etc.
- Fabrication of 3/6/9 volt simple DC power supply using half wave rectifiers. [Battery Eliminator]
- Fabrication of 3/6/9 volt simple DC power supply using Centre Tapped Full wave rectifiers. [Battery Eliminator]
- Fabrication of 3/6/9 volt simple DC power supply using Full wave Bridge rectifiers. [Battery Eliminator]
- Fabrication of T and PIE Filter.
- Fabrication of a zener regulated DC Power supply.
- Fabrication of DC stabilized supply using series and shunt pass transistors.
- Study the Voltage Double and Triple Circuits.
- Demonstration and study of Audio Frequency Amplifiers.
- Demonstration and study of Radio Frequency Amplifiers.
- Study the Oscillatory Tank Circuit.

**PAPER-III** **AM/FM RADIO RECEIVER AND FAULT ANALYSIS**

**THEORY**

**Time : 2 hrs**

**Theory : 30 Marks**
**CCE : 10 Marks**
**Practical : 50 Marks**
**Total : 90Marks**

## Communication

Basic concepts of Communication, Modulation,Need of Modulation,Types of Modulation, AM Modulation, FM Modulation, Transistor AM Modulator, Limitations of AM Modulation, Advantages and Disadvantages of FM Modulation, Block Diagram of Amplitude Modulated Transmitter, Block Diagram of Frequency Modulated Transmitter, Demodulation or Detection,Requirements of Demodulation, Diode Detector, Different modes of wave propagation.

### AM Radio Receivers

Basic principles and block diagram of AM receivers and Stages. Sensitivity, Selectivity, Fidelity, Heterodyning,

### FM RadioReceiver

Basic principles and block diagram of FM receivers and Stages, Difference between FM and AM receivers.

### Fault Analysis of Radio Receiver

Introduction to systematic fault finding techniques, Sectionalization and signal injection and other such techniques.Typical case histories and exercises.Mechanical fixtures-Typical troubles and their remedy.

## AM/FM RADIO RECEIVER AND FAULT ANALYSIS

**Time : 3 hrs** **PRACTICAL** **Marks : 50**

- Study the Basic Concept of Communication system.
- Draw and Explain Block diagram of AM Radio Receiver.
- Draw and Explain Block diagram of FM Radio Receiver.
- Study the Amplitude Modulation with wave diagram.
- Study the Frequency Modulation with wave diagram.
- Draw and Explain Demodulator circuit
- Assembling a medium wave transistor/radio receiver.
- Measuring voltages at different test points of a transistor/radio receiver.
- Check waveforms at input and output parts of different stages with the help of CRO.
- Alignment of IF stages.
- Alignment of RF stages.
- Fault finding in Mechanical fixtures viz. Dial Cord, Volume control, loud speaker etc.
- Tracing the circuit of a given transistor/radio receiver

## (iii)TRADE : ARCHITECTURE

### PAPER-I ENGINEERING DRAWING - I

### THEORY

**Time :2hrs**

**Theory : 30Marks**
**CCE : 10 Marks**
**Practical : 50 Marks**
**Total : 90 Marks**

**Introduction**

Introduction and Scope of Civil Engineering/Architectural Drawing, Instruments and Material used in Engineering Drawing - Drawing Board, Drawing Sheet, Tee Square, Set Square, Parallel Bar, Protector, Scale, Rubber, French Curve , Drawing Pencil, Drawing Instrument Box, Sand Paper, Drawing Pin/ Clips, Duster, Drawing Ink etc, Drawing Machine (Mini Drafter) and its Uses, Precautions in use of Drawing Instruments.

### Planning and Layout of Drawings

Need for Planning of Drawing Sheet, Standard Sizes,Margins, Size and Purpose of Title Blocks, Maintenance of Drawing Sheet, Format (With Title, Subject Name, Scale , Orientation etc.)