

Certificate Course in Course Maintenance of Electrical & Electronic Appliances.

Detailed Syllabus

Theory

Paper – I Electrical Appliances

	No. of lectures
1. Safely precaution of shock treatment – To make the students familiar with shop Discipline, Causes of electrical fire & electrical shock, Precautions to avoid electrical fire & electrical shock	7
2. Electrical common hand tools – Familiarize the students with common tools, safe use of tools, their adjustments & applications	7
3. Electricity – Electricity as a source of energy. Definitions of voltage, current, resistance, energy & power, their units, Factors affecting the resistance of a conductor. Difference between A.C. & D.C. voltage & current, Ohm's law.	7
4. Electrical room heater – Construction & working principle of reflector type room heater, Common defects, testing & repairs.	7
5. Electrical Iron – Types of electrical iron, auto iron, Construction & working principle of electrical iron, Common defects, testing & repairs.	4
6. Electrical Stove - Types of electrical stove, coiled, covered, hot-plate, oven, cooking range, construction & working principle of electrical stoves.	4
7. Immersion heater & Geyser – Construction & working principle & use of immersion heater, common defects, testing & repairs. Types of Geyser, testing, installation, common faults & their remedy	9
8. Electric kettle & coffee percolator – Construction & working principle of electric kettle & coffee percolate, Common faults, their causes, testing and repairs.	7
9. Table lamp, night lamp & tube light – Constructional details, circuit diagram, diagram of tube-light, common faults, their causes, testing & repairs.	7
10. Electric bell, buzzer & door chimes – Construction, working, principle, faults, their causes, testing & repairs	

Paper – II Electronics Appliances

1. Resistance – Types of the resistor, Ohm's law, Kirchhoff's law, series & parallel combination	4
2. Inductance – Types of the coils, inductance, Resistance series & parallel combination of coils.	2
3. Transformer – Types of transformer, turn, volt, current, ratio, TR, winding.	6
4. Diodes - P-N junction theory, power diode, varactor, diode, led, zener diode, laser diode.	6

5.	Rectifier circuit – Bridge rectifier, center tap rectifier, half wave rectifier.	2
6.	Filter circuit – LC filter, RC filter, PHI filter.	3
7.	Capacitor – Different types of capacitor, capacitive reactance, variable cap.	2
8.	Meters – Current meters, volt meter, Watt meter, Ohm meter.	3
9.	Loud Speaker & Microphone – Different types of loud speaker & microphone, reckoning of loud speaker.	5
10.	Transistor – Transistor theory, common base, common collector, common emitter configuration, transistor testing.	6
11.	Voltage amplifier – Voltage amplifier circuit & its use.	4
12.	Power amplifier – Power amplifier circuit & its use.	4
13.	Feed back – positive & negative feedback advantage & disadvantage of feedback, tank circuit.	4
14.	Oscillator – R. F. oscillator, AF oscillator, pattern generator, function of gene.	4
15.	C.R.O. – Cathode ray tube, block diagram of CRO, Different types of CRO, fault finding by CRO.	6
16.	Transistor Radio Receiver – Super heterodyne radio receiver block diagram, theory of different stages.	6
17.	Transformers – Elementary electromagnetic, properties of transformers, losses, the core, the windings, general design consideration, power transformers, transformers in converters and inverter ferrite core and their properties, Impedance transformers, current transformers. Different types of insulating material used in transformer wiring, their properties.	

Practical
Paper – I

1. Dismantling & reassembling of reflector type room heater.
2. Testing & repairing of R. T. R. H.
3. Dismantling of reassembling of electronic iron (ordinary & auto)
4. Testing & repairing of electronic iron (Ordinary & auto)
5. Dismantling & reassembling of electronic stove. (coiled type, covered type, hot plate)
6. Testing & repairing of electronic stove.
7. Dismantling & reassembling of cooking range.
8. Testing & repair of cooking range.
9. Dismantling & reassembling of electronic toaster.
10. Testing & repairing of electronic Geyser.
11. Testing & repairing of electronic Geyser.
12. Testing & repairing of electronic Geyser.
13. Dismantling & reassembling of electronic Geyser.
14. Testing & reassembling of electronic kettle & coffee percolator.
15. Connection of tube light, testing and repairing of tube light, table lamp, night lamp.
16. Dismantling & reassembling of electronic Bell, Buzzer & Door chimes.
17. Testing and repairing of electronic Bell. Buzzer & Door chimes.

Paper – II

1. **Resistance** –
 - a) Color coding of resistor
 - b) Verification of Ohm's Law.
 - c) Resistor's combination
2. **Inductance** –
 - a) Inductance measurement
3. **Transformers** –
 - a) Transformer testing.
 - b) Transformer winding.
4. **Diode** –
 - a) Diode in forward bias.
 - b) Diode in reverse bias.
 - c) Y-I characteristic of Diode.
5. **Rectifier circuit** –
 - a) Half wave rectifier.
 - b) Bridge type rectifier.
 - c) C) Center- tap rectifier.
6. **Filter circuit** –
 - a) Rectifier circuit using filter.
7. **Capacitor** –
 - a) Series resonant circuit.
 - b) Parallel resonant circuit.
8. **Meter** –
 - a) To extend range of current meter & voltmeter.
9. **Loud Speaker & Microphone** –
 - a) Replacement of cone in loud speakers.
 - b) Preparation of loud speaker box.
10. **Transistor** –
 - a) Common base configuration.
 - b) Common emitter configuration.
 - c) Transistor testing.
11. **Voltage amplifier** –
 - a) Voltage amp-circuit design.
 - b) Testing.
12. **Power amplifier** –
 - a) Power amp circuit design.
 - b) Testing.
13. **Feed-Back** –
 - a) Testing of different feedback circuits.
14. **Oscillator** –
 - a) Study of different wave forms by using function gene.
 - b) Use of pattern gene.
15. **C.R.O.** –
 - a) Component testing by using CRO.
 - b) Study of different waveforms by using CRO.
16. **Transistor Radio** –
 - a) Tracing.
 - b) To assemble RF amplifier.
 - c) To assemble IF amplifier.
 - d) To assemble detector & voltage amplifier stage.
 - e) To assemble power amplifier stage.

- f) Alignment of RF, IF amplifier.
- g) Fault finding of receiver.

17. **Transformers** –

- a) Operation of coil winding machine and getting familiar with different tools used in coil winding.
- b) Designing and winding step up transformer.
- c) Designing and rewinding of step down transformer.
- d) Designing and rewinding of ferrite core transformers.

A) List of books to be purchased

1. Electrical technology : Edward Hughes
2. Study of electrical Appliances & devices : K. B. Bhatia
3. Elements of electrical gadgets : K. B. Bhatia
4. Small appliances servicing P. T. Brockwell Jr.
5. How to repair small appliances: Jack Darr.
6. Audel home appliances servicing : Edwin Panderson
7. Electrical gadgets & their repairs : S. R. Rao
8. Electrical appliances : L. M. Anwani
9. Elements of basic electricity and electrical measurements : K. B. Bhatia
10. Fundamentals of Maintenance of Electrical Equipment : K. B. Bhatia
11. I. E. Rules
12. Home appliances – Edwin
13. Fractional Horse Power Motors : Kennard C. Graham, D. B. Taraporewala Sons & Co., Bombay
14. Fractional & subfractional Horse Power Motors : Cyril G. Veinott, Macgraw Hill & Co. Ltd., U.S.A.
15. Indian Electricity Rules : Nausheer Bharucha, D. B. Taraporewala Sons & Co., Bombay.
16. Electronic circuits & applications – Grob
17. Advanced Industrial electronics – Morris
18. Electronics Communication – Sharader
19. Basic electronics – Zbar & Malvino
20. Electronic Principles – Malvino
21. Applied digital electronics – Ward
22. Servicing manuals – (2000/-)