

Semester-III
**EEM-DSC-1C: Testing and Troubleshooting of Electronic and
Electrical Equipment**
(Credits: Theory-04, Practicals-02)

Unit-I

Review of passive components, testing of fixed resistors, variable resistors, potentiometers, failures in potentiometers, servicing of potentiometers, testing of LDRs and Thermistors. Testing of capacitors, Failures in capacitors and precautions, measurement of inductance, testing of inductors, Simple circuits using resistors, capacitors and Inductors. Current and voltage measurement, simple capacitive circuits. **(15 Lectures)**

Unit-II

Linear and Non Linear Elements, Active and Passive Elements, Unilateral and Bilateral Elements, Time variant and Time Invariant Elements, Dependent and Independent sources, Tellegan's Theorem, Star Delta Conversion, Superposition Theorem, Thevenin and Norton Theorems, Maximum Power Transfer Theorem, Reciprocity Theorem. **(15 Lectures)**

Unit-III

Study of Transient and Steady State behavior of circuits, RL, RC & RLC circuits. Examples of DC transient and AC transient analysis using Source free and source induced circuit examples. Introduction to Phasor diagram for different circuits. Resonance, Series and Parallel type, Quality Factor. **(15 Lectures)**

Unit- IV

Solder Joint, Dry Solder Joint, Cold Solder Joint, Good and Bad Solder Joints, Soldering Material, Soldering Tools, Soldering Iron, Soldering Gun, Soldering Station, Soldering Techniques, Testing a Soldering, Ultrasonic Soldering, Tools used for De-Soldering, De-Soldering Techniques Joint, Precautions during Soldering and De-Soldering. **(15 Lectures)**

Recommended Books:

1. Modern Electronic Equipment: Troubleshooting, Repair and Maintenance by Khandpur, TMH 2006.
2. Electronic Instruments and Systems: Principles, Maintenance and Troubleshooting by R. G. Gupta Tata McGraw Hill Edition 2001.
3. Fundamentals of Electric Circuits by Charles K. Alexander and Matthew N. O. Sadiku.

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List of Practical's (EEM- DSC-1C)

Practical work includes the detailed explanation of all the circuit components and blocks of the system. A full demonstration of the system is necessary before proceeding with the hands on experimentation. Atleast 10 experiments from the following:

Practicals:

1. Study of Oscilloscope.
2. Study of CRO and determination of amplitude, frequency and time of observed voltage waveform.
3. Experiments for the Development of Soldering/De-soldering skills for constructing a simple circuit on PCB.
4. Study of Electronic/Electric components: Resistors, Capacitors, Switches, Relays, Fuse.
5. Study of Oscilloscope.
6. Study of CRO and determination of amplitude, frequency and time of observed voltage waveform.
7. Study of Electronic/Electric components: Resistors, Capacitors, Switches, Relays, Fuse.
8. Design and study of a Regulated Power supply.
9. Testing of any electronic equipment (measuring voltages/currents at checkpoints).
10. Testing and troubleshooting of semiconductor devices (PN Junction diode, special purpose diodes).
11. Testing and troubleshooting of bipolar junction transistor.
12. Testing and troubleshooting of Field Effect Transistor.
13. Testing and troubleshooting of OP-Amp.
14. Testing and troubleshooting of linear and digital ICs.

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