

## Semester-IV

### EEM-DSC-1D: Measuring Equipments and Troubleshooting of Electronic and Electrical Equipment

(Credits: Theory-04, Practicals-02)

#### Unit I

Measurement error, accuracy and precision in analog and digital circuits, Relative and Absolute error, Transducers, classification modes in transducers, Passive and Active type, primary and secondary types. **(15 lectures)**

#### Unit II

Concept of maintenance, Principles of Maintenance, Benefits of Maintenance, System Approach to maintenance, challenges in Maintenance, Maintenance Objectives, Responsibilities of Maintenance Department, Types of Maintenance systems, Effects of Maintenance. **(15 lectures)**

#### Unit III

Analog Multimeter, Digital Multimeter, Frequency meters, Graphical multimeter, megger, Oscilloscope: dual beam vs dual trace oscilloscopes, digital storage oscilloscope, controls on digital oscilloscope, Measurements with oscilloscope, precautions in use of an oscilloscope, oscilloscope probes, logic analyzer, Wattmeter. **(15 lectures)**

#### Unit IV

Nature of faults, Fault location procedure, Fault finding aids - Service and maintenance manuals and instruction manuals, Importance of Service Manual, Component Data Book. Test and measuring instruments, special tools Troubleshooting techniques, approaching components for tests, Grounding systems in Electronic Equipment, Corrective actions. Practical approach to trouble shooting of Voltage Stabilizers and inverters. **(15 lectures)**

#### Reference Books:

1. Modern Electronic Equipment: Troubleshooting, Repair and Maintenance by Khandpur, TMH2006.
2. Maintenance Engineering and Management by R C Mishra and K Pathak, Prentice Hall of India.
3. Electronic Instrumentation by A. K. Sahwney.
4. Consumer Electronics by S. P. Bali, Pearson
5. Electronic Testing and Fault Diagnosis by G. C. Loveday, A. H. Wheeler Publishing Handbook of electrical design by Neil Sclater, Publisher MC Graw Hill

*(Approved by Board of Studies for Academic Session 2017 and onwards)*

### List of Practical's (EEM- ~~SEC1~~ (Dsc))

*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:*

1. Study and testing of PCB layout of any electronic circuit.
2. Practical on assembling/de-assembling of electronic equipment.
3. Design of regulated power supply using Op-amp.
4. Design of battery charger.
5. Design and study of AC Voltage Stabilizer.
6. Practical tests of repairing of DC-AC Inverter.
7. Testing of Electrical equipment.
8. Testing of Electronic equipment.
9. Design of UPS.
10. Design any electrical equipment using wiring diagram.
11. Design any electronic equipment using wiring diagram.

*(Approved by Board of Studies for Academic Session 2017 and onwards)*