Sandip Foundation's
Sandip Institute of Technology & Research Centre, Nashik
Department of Electronics & Telecommunication

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Name of Event: Three Days workshop on "Electronic Component Testing"

Name of resource person: Prof. O. S. Vaidya, Prof. S. Y. Kanawade, Prof. Y. M. Gaikwad, Prof. M. V. Nikumbh

Objectives: To make students skillful in practical, projects and for industrial jobs by improving the knowledge of various components such as Identification, Function, Testing, Pin Configuration, Ratings, and Applications.

Contents Covered in the Workshop:

1] BREADBOARD

A breadboard (proto board) is a construction base for prototyping of electronics. Originally it was literally a bread board, a polished piece of wood used for slicing bread. In the 1970s the solder less breadboard (AKA plug board, a terminal array board) became available and nowadays the term "breadboard" is commonly used to refer to these. "Breadboard" is also a synonym for "prototype". Because the solderless breadboard does not require soldering, it is reusable. This makes it easy to use for creating temporary prototypes and experimenting with circuit design. For this reason, solder less breadboards are also extremely popular with students and in technological education. Older breadboard types did not have this property. A strip board (Vero board) and similar prototyping printed circuit boards which are used to build semi-permanent soldered prototypes or one-offs cannot easily be reused. A variety of electronic systems may be prototyped by using breadboards, from small analog and digital circuits to complete central processing units

The middle portion of breadboard is vertically short. In this portion we make Connections of circuit. Whereas upper and lower portion is horizontally short. Basically there are three parts. In upper part we give connection of Vcc and in last part we give ground while connections. We can make series and parallel connections very easily.

2] LCR-Q METER:

An LCR meter is a piece of electronic test equipment used to measure the inductance (L), capacitance(C), and resistance(R) of a component. In the simpler versions of this instrument the impedance is measured internally and converted for display to the corresponding capacitance or inductance value. Readings will be reasonably accurate if the capacitor or inductor device under test does not have a significant resistive component of impedance. More advanced designs measure true

Inductance or capacitance, and also the equivalent series resistance of capacitors and the Q factor of inductive components. Operation Usually the device under test(DUT) is subjected to an AC voltage source. The meter measures the voltage across and the current through the DUT. From the ratio of these the meter can determine the magnitude of the impedance. The phase angle between the voltage and current is also measured in more advanced instruments; in combination with the impedance, the equivalent capacitance or inductance, and resistance, of the DUT can be calculated and displayed. The meter must assume either a parallel or a series model for these two elements. The most useful assumption, and the one usually adopted, is that LR measurements have the elements in series (as would be encountered in an inductor coil) and that CR measurements have the elements in parallel (as would be encountered in measuring a capacitor with a leaky dielectric).

An LCR meter can also be used to judge the inductance variation with respect to the rotor position in permanent magnet machines (however care must be taken as some LCR meters can be damaged by the generated EMF produced by turning the rotor of a permanent magnet motor). Hand held LCR meters typically have selectable test frequencies of 100 Hz, 120 Hz, 1 kHz, 10 kHz, and 100 kHz for top end meters. The display resolution and measurement range capability will typically change with test frequency.

Outcome: The Sessions were conducted proactively including the participation of students in the entire component evaluation process including kits for component testing. Understanding the nature of the component and then testing the component by use of Digital Multimeter by participating students in groups of 2 or 3.

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