

Vidyalankar

S.E. Sem. IV [BIOM]
Electronic Instruments

SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks
Term Work : 25 Marks

1. Fundamental Concepts of Measurement & performance characteristics of an Instrumentation System :

System Configuration –Block Diagram of a generalized measurement system, Zero Order System, First Order System – Response of a system to Step, Ramp, Impulse Inputs & Frequency Response. Second Order System–Response of a system to Step, Ramp & Frequency Response. Dead Time Element, Dynamic Response of a Measurement system.

2. Electronic meter :

Principle of Operation, ammeter, ohmmeter, voltmeter, Advantages over Conventional type Analog Voltmeter, Factors involved in selection of Voltmeter, FET Voltmeter, Peak Responding, Average Responding, and True RMS responding voltmeter, Multimeter.

3. Digital Voltmeter :

Methods of Analog to Digital and Digital to Analog Conversion. Principle of working of Ramp Type, Dual, Slope Type, Successive Approximation Type Digital Voltmeter. Resolution & Sensitivity of digital voltmeter.

4. Frequency Meter And Phase meter :

Analog and Digital frequency meter. Analog and Digital Phase meter

5. Oscilloscopes :

Block Diagram study of C.R.O. Description of Panel Layout & Implementation of controls, Requirements of Time base, Delayed Time Base, Lissajous Patterns, Intensity modulation, Velocity modulation, use of these in phase & frequency measurements, Dual trace. Double beam, Sampling, Storage, Digital readout oscilloscope, Use of CRO in tracing Diode & transistor characteristics.

6. Signal Generator: Requirement of a good laboratory type Signal Generator, A.F. Signal Generator, Function Generator.

7. Data Acquisition : Data Acquisition System – Generalized DAS, Multi channel DAS, PC based DAS.

8. Writing System :

Ink jet, Potentiometric, UV, Thermal, Light gate, Magnetic, Laser optics and Instrumentation tape recorders.

9. Medical Display System :

Oscilloscope for biomedical measurements, Single & multichannel Display, Non-fade Display System, LCD Display System & Touch Screen Display System

References :

1. Electronic Instrumentation & Measurement Techniques (*Cooper W.D. & Helfrick A.D.*)
2. Electronic Instrumentation (*Kalasi H.S.*)
3. Electronic Instrumentation (*Carr and Brown*) Pearson Publication
4. Instrumentation devices and system (*Rangan, Sharma and Mani*)
5. Electrical & Electronic Measurement & Instrumentation (*A.K.Sawhney*)
6. Handbook of biomedical instrumentation (*R.S.Khandpur*)

