


19BM213 BIOMEDICAL EQUIPMENTS

UNIT - I

Introduction to Medical Instrumentation: Block diagram of a medical instrumentation system; Bio-signals: Origin and characteristics of Bio potentials-ECG, EEG, EGG, EMG, ENG, EOG, and ERG; Problems encountered with measurements from human beings; Generalized medical instrument specifications, Electrode-Electrolyte Interface. Half-cell potential, Off set Voltage; Types of Electrodes- External, Internal and Microelectrodes; mathematical Treatment of Electrodes- Equivalent circuits and Applications.

UNIT - II

Medical Display Devices and Recorders: Display Devices- Basic requirements for the display and recording of Bio-signals. Types of medical display devices; Medical recorders: Classification of recorders, PMMC writing systems; General features of ink-jet, thermo sensitive and optical recorders; Oscilloscopes: Basic description, Cathode Ray Oscilloscope (CRO), Dual beam oscilloscope. Analog storage oscilloscope, Digital storage oscilloscope, Medical, Multi Heme and Non-fade display systems; Liquid crystal displays- Introduction, Passive-matrix and active, matrix addressed LCDs.

UNIT - III

Cardiac Instrumentation: Electrocardiography, Block diagram. Circuits, electrodes and their placement; Lead configuration and general ECG waveforms; ECG monitors: Single channel and multi-channel ECG systems, Holier monitors, Stress test systems; Blood Pressure measurement- Introduction to blood pressure. Direct and indirect methods of Blood Pressure measurements. Blood Flow measurement: Introduction to hemodynamics. Electromagnetic and Ultrasonic techniques of Blood flow measurement; Heart sounds- Origin of Heart Sounds, Types of microphones for heart sound measurement, Contact and non-contact type of measurement, Phonocardiography.