

PET6J004 BIOMEDICAL ELECTRONICS**MODULE-I**

Bioelectric Signals and Electrodes- Sources of biomedical signals, basic medical instrumentation system, PC based medical instruments, general constraints in design of medical instrumentation systems; origin of bioelectric signals, Electrocardiogram (ECG), Electroencephalogram (EEG), Electromyogram (EMG), Electrooculogram (EOG); Electrode-tissue interface, polarization, skin contact impedance, motion artifacts, Silver Chloride electrodes, Electrodes for ECG, Electrodes for EEG, Electrodes of EMG, Electrical conductivity of electrode jellies and creams, microelectrodes; Electrocardiograph-block diagram, ECG leads, effects of artifacts, multi-channel,

MODULE-II

Pacemakers & Defibrillator- Need for cardiac pacemaker, external pacemaker, implantable pacemakers-types, ventricular synchronous demand pacemaker, programmable pacemaker, power sources for implantable pacemakers; Need for defibrillator, DC defibrillator, automatic external defibrillator, implantable defibrillators.

MODULE-III

Blood Flow & Cardiac Output Measurement- Electromagnetic blood flow meter-principle, square wave electromagnetic flow meter, Doppler shift ultrasonic flow meter

Advanced Diagnostic & Therapeutic Instruments- Principle of surgical diathermy & surgical diathermy machine, Electro diagnosis-Electrotherapy-functional block diagram and working, interferential current therapy.

MODULE-IV

Biosensors- Electrochemical transducers, Electrode potential and reference electrodes, potentiometric sensors, amperometric sensors, electrochemical gas sensors; chemical transducers of acoustic and thermal principles. Biosensors – Enzyme based biosensors, immune sensors, and microbial sensors.

ADDITIONAL MODULE (TERMINAL EXAMINATION-INTERNAL)

1. ECG machine, vector cardiograph, phono cardiograph-origin of heart sounds; Microphones and amplifiers for PCG; Artificial kidney-Principle and haemodialysis machine; Continuous measurement of chemical quantities.

TEXT BOOK

1. Biomedical signal processing :Principles and Technique, D.C Reddy Tata McGraw- Hill Education Pvt.Ltd, 2005