AMMT24 MEDICAL MECHATRONICS SYSTEM

UNIT-1 INTRODUCTION
1.1 Cell structure- electrode- electrolyte interface, electrode potential, resting and action potential
1.2 Electrodes for their measurement, ECG, EEG, EMG- machine description
1.3 Methods of measurement- three equipment failures and trouble shooting.

UNIT-2 TRANSDUCERS FOR BIO-MEDICAL INSTRUMENTATION
2.1 Basic transducer principles Types- source of bioelectric potentials- resistive, inductive, capacitive, fiber-optic, photoelectric and chemical transducers
2.2 Their description and feature applicable for biomedical instrumentation
2.3 Bio & Nano sensors & application

UNIT-3 SIGNAL CONDITIONING, RECORDING AND DISPLAY
3.1 Input isolation, DC amplifier, and power amplifier, and differential amplifier- feedback, op-Amp electrometer amplifier, carrier Amplifier- instrument power supply.
3.2 Oscillography- galvanometric- X-Y, magnetic recorder, storage oscilloscopes- electron microscope- PMMC writing systems- Telemetry principles – Bio telemetry.

UNIT-4 MEDICAL SUPPORT
4.1 Electrocardiograph measurements- blood pressure measurement: by ultrasonic method- plethysonography- blood flow measurement by electromagnetic flow meter cardiac output measurement by dilution method- phonocardiography- vector cardiography.
4.2 Heart lung machine- artificial ventilator- Anesthetic machine- Basic ideas of CT scanner- MRI and ultrasonic scanner- Bio-telemetry
4.3 Laser equipment and application- cardiac pacemaker- DC- defibrillator patient safety
4.4 Electrical shock hazards. Centralized patent monitoring system.

UNIT-5 BIO-MEDICAL DIAGNOSTIC INSTRUMENTATION
5.1 Introduction- computers in medicine
5.2 Basis of signal conversion and digital filtering data reduction technique-
5.3 Time and frequency domain technique- ECG Analysis.

References Books:
1. Khandpur, R.S., "Handbook of Biomedical Instrumentation", TMH, 1989.
2. Geddes L.A., and Baker, L.E., "Principles of Applied Bio-medical Instrumentation", 3rd Edition, John Wiley and Sons, 1995.
3. Tompkins W.J., "Biomedical Digital Signal Processing", Prentice Hall of India, 1998