

1. Basic Electronics Fundamentals

Ohm's Law, Basic electrical quantities and units –Voltage, Current, Resistance, Frequency; Electronic components (Resistor, Capacitor, Inductor, Diode, Transistor); AC and DC fundamentals; Rectifiers and power supply basics; Electrical safety and grounding; accuracy & reliability of measuring equipment.

2. Electronic Test and Measuring Instruments

Multimeter (voltage, current, resistance measurement), Oscilloscope basics, Signal generator, Safety checks, Continuity testing, Basic troubleshooting techniques

3. Biomedical Instrumentation

Introduction to biomedical equipment, Principles of medical signal measurement, Role of sensors and transducers in medical equipment, Electrical safety of medical devices, Preventive maintenance of medical/laboratory equipment

4. Basics of common Hospital Biomedical Equipment

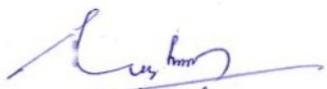
ECG Machine, Pulse Oximeter, Working principle: Red and infrared LED sensors, Measurement of SpO₂, Defibrillator, Ventilator, Infusion Pump, Digital BP Monitor, pressure measurement, Sensor basics

5. Laboratory Equipment and their Maintenance

Laboratory Centrifuge, Incubators, water baths, ovens, sterilizers, UPS, Infusion pumps, etc.; UPS; Battery backup; Importance of UPS during power failure; Preventive Maintenance Practices: Routine inspection, Safety checks, Reducing equipment failure

6. IPBX Telephone Exchange System

Basic understanding of: concept of IPBX, Internal communication systems, Extensions and call routing, switching matrix concept; Telephone System Hardware: Telephone handset components, Microphone, Speaker, twisted pair cable, Line wiring and connectors; IPBX Maintenance and Troubleshooting: checking dial tone, Line continuity testing, Fault diagnosis


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