

## **M-SCHEME DETAILED SYALLABUS**

### **34032 ELECTRICAL CIRCUITS AND INSTRUMENTATION**

#### **UNIT I D.C. CIRCUITS AND THEOREMS**

Definition and unit for voltage, current, power, resistance, conductance, resistivity- Ohm's law – only simple problems in ohm's law- Kirchoff's current law and voltage law. Series circuits –parallel circuits, series parallel circuits. Mesh Method (simple problems) Thevenin's - Norton's theorems, Super position and Maximum power transfer theorem – Statement and Explanation (simple problems)

#### **UNIT II A.C. CIRCUITS AND RESONANCE**

##### **A.C. CIRCUITS**

AC through single pure resistance, pure inductance, pure capacitance - voltage and current relationship and (to mention only) the equation for power and power factor in each case ( only simple problems).Definition for impedance, reactance, admittance, conductance, impedance, Phase angle, power factor and power. AC circuits – Derivation for impedance and admittance, power and power factor in Series and Parallel R-L ,R-C ,R-L-C circuits. Analysis of Parallel R-L circuit, R-C circuit, R-LC circuit (qualitative treatment only).

##### **RESONANCE**

Resonance - series resonance - parallel resonance - condition for resonance - resonant frequency – Q factor - resonance curve - bandwidth (only simple problems).

#### **UNIT III TRANSFORMERS AND MACHINES**

##### **TRANSFORMERS**

Transformer – Ideal transformer – construction - working principle –EMF equation Losses in transformer- core loss, copper loss- Efficiency-

For Notes, Syllabus, Question Papers and Many more

Regulation OC, SC test on transformer -List of applications (qualitative treatment only)

## **MACHINES**

D.C. Machines - DC-Generator –Working principle - Types- Applications DC motor- working principle - types- applications (qualitative treatment only ) Single phase induction motor- types- construction and principle of operation of capacitor start induction motor- Applications - stepper motor-working principle-uses (qualitative treatment only)- Universal Motor (qualitative treatment only) Difference between single phase and three phase supply.

## **UNIT IV MEASURING INSTRUMENTS AND CRO**

### **MEASURING INSTRUMENTS**

Definition for Measurement, Instrument- Errors in Measurement - Calibration- Indicating instruments – Basic forces for indicating instruments - construction and operation of permanent magnet moving coil Instrument -Advantages – Disadvantages of PMMC - Shunts and Multipliers - DC ammeter-DC voltmeter-voltmeter sensitivity. Bridges- Types - Wheat stone bridge - applications -Universal impedance bridge arrangements to measure R, L, C

### **CRO**

CRO- Block diagram and principle of operation of CRO- operation of CRT Electrostatic focusing- Electrostatic deflection (no derivation ) - Block diagram of vertical deflection system- Applications of CRO - Types of CRO- Block diagram and operation of dual trace CRO- Dual beam CRO - Comparison between dual trace and dual beam CRO – Digital storage Oscilloscope - Block diagram- advantage. Block diagram-working principle of Function Generator

## **UNIT V TRANSDUCERS, SENSORS & TEST INSTRUMENTS**

### **TRANSDUCERS**

Transducers –Classification of transducers Strain gauge - Types- uses. Construction operation and applications of photo electric

For Notes, Syllabus, Question Papers and Many more

transducer LVDT, RVDT and Load cell. Principle of working of Thermocouple- Temperature measurement using thermocouple - list of applications- Principle of working of Thermistor –Temperature measurement using thermistors - Types (NTC, PTC) – List of applications

## **SENSORS**

IR range sensor – IR proximity sensor- Ultrasonic range sensor- Touch Sensor.

## **TEST INSTRUMENTS**

Digital voltmeter –Types ( to list only ) - Basic block diagram of DVM - Block diagram of Digital multimeter- Advantages over analog instruments - Block diagram of Digital frequency counter– Simple PC based Data Acquisition system – Block

## **REFERENCE BOOKS:**

1. Electrical Technology B.L. Theraja Division of Nirja constructions and development co. (P) Ltd., - 1994.
2. Electric Circuit Theory Dr. M. Arumugam, N. Premkumaran Kanna Publisher, Delhi -1997
3. Electronic Measurements and Instrumentation R.K.Rajput S. Chand (Third Edition)- 2009