TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS


Formation of partial differential equations eliminating arbitrary constants and functions - solution of first order equations - four standard types - Lagrange’s equation - homogeneous and non-homogeneous type of second order linear differential equation with constant coefficients.

One-dimensional wave equation and one-dimensional heat flow equation - method of separation of variables - Fourier series solution.


EE201

DC MACHINES AND TRANSFORMERS

Principle of Energy conversion – Basic magnetic circuit analysis Faraday's law of electromagnetic induction – singly and doubly Excited magnetic field systems – Torque production in rotating machines and general analysis of electro mechanical system

DC Generator – constriction, principle of operation, types – emf equation – Characteristics - commutation - Armature reaction

DC motor – principle of operation, types – Torque equation – Electrical & Mechanical characteristics – starting – speed control – Various testing – Braking
Transformers – construction, principle of operation, types – Equivalent circuit - regulation and efficiency – Auto transformer

Three phase transformer connection-Scott connection – all day efficiency - Sumpner's test - parallel operation of transformers.


EE203

CIRCUIT THEORY

• Fundamental concepts of DC. and A.C. circuits, R, L and C elements -phasor diagram -complex impedance- real and reactive power -series and parallel circuits- loop and nodal analysis.

• Voltage -current source transformations, Various Network theorems and its applications to dc and ac circuits, star-delta transformations

• Resonance in series and parallel circuits, self and mutual inductances, coefficient of coupling - dot convention- analysis of coupled circuits,

• Three - phase star and delta circuits with balanced and unbalanced loads power measurements-power factor calculations.

• Time response of RL, RC and RLC circuits for step and sinusoidal inputs

References:


EE205

ELECTRON DEVICES

- Semi Conductors- charge carriers, electrons and holes in intrinsic and extrinsic semi conductors-Hall effect
- Diodes-PN junction-current equation -junction capacitance-breakdown characteristics, Zener, tunnel, Schottky diodes.
- Bipolar junction transistors - Low frequency and high frequency equivalent circuits – analysis of CB, CE, CC amplifier configurations.
- Uni-polar devices-FET, MOSFET, UJT and Opto-Electronic devices-theory and characteristics.
- Rectifiers and switched mode power supplies - theory and design, filter circuits, applications

REFERENCES:

ME231

THERMAL ENGINEERING

- Definitions of system - system boundary, property, process, cycle, heat, work, reversible and quasistatic processes- Heat and work transfer during different types of processes

- First law of Thermodynamics - Closed system application-internal energy -heat transfer calculations -open system applications-non flow and flow System applications

- Entropy change – Gas power cycle -Vapour power cycle-Rankine cycle-reheat cycle-regenerative cycle-calculations for efficiency and power output using steam tables and mollier chart

- Reciprocating air compressors –optimum pressure ratio in multistage compression-inter cooling-effect of clearance volume- Performance and testing of IC engines.

**REFERENCES:**


**MECHANICS OF SOLIDS AND FLUIDS:**

- Vapour Pressure – Pressure at a point its variation – Measurement with Piezometer, manometers and gauges.
- Continuity equation in one dimension – Bernoulli’s equation – Venturimeters and Orifice meters – Flow through pipes – Laminar Turbulent flow Major losses.

**REFERENCES:**


EE207

DC MACHINES AND TRANSFORMERS LABORATORY

1. Open circuit and load characteristics of DC shunt generator
2. Load characteristics of DC compound generator
3. Load test on DC shunt motor
4. Speed control of DC shunt motors
5. Swinburne's test
6. Open circuit and short circuit test on single phase transformer
7. Separation of no load losses in a single phase transformer
8. Sumpner's test
9. Load test on single phase transformer
10. Parallel operation of single phase transformer

EE209

CIRCUITS AND DEVICES LABORATORY

1. Verification of Circuit theorems.
2. Half wave and full wave rectifiers.
3. Bridge Rectifier.
4. Volt-ampere characteristics of semiconductor diode and zener diodes.
5. Characteristics of UJT
6. Characteristics of FET.
7. Clipping and clamping circuits.
8. Transistor characteristics - CE.
9. Transistor characteristics - CB.