DEE-401 .ELECTRICAL MACHINE- II

UNIT: I

Three phase Induction Motor - Production of rotating magnetic field, principle, construction and types of induction motors. Equivalent circuit, torque equation, torque-slip characteristics. Types of starters: DOL, Star-delta, Autotransformer type, rotor resistance type, contactor type starter. Speed control. No load and blocked rotor test, losses and efficiency. Braking and applications. Simple numerical.

UNIT:II

Synchronous motor - Principle, construction, phasor diagram, effect of change in excitation, V curves, synchronous condenser, starting of motors, hunting and its prevention, coding of synchronous machines.

UNIT:III

Synchronous generator - Principle, construction, salient and cylindrical rotors, speed-frequency relationship, EMF equation, distribution and pitch factor, equivalent circuit, synchronous impedance, regulation, O.C.C. and S.S.C., load characteristics, phasor diagram, parallel operation. Methods of synchronization, power-angle characteristics.

UNIT:IV

Single phase induction motors - Principle, double revolving field theory. Types of motors with their construction, characteristics and applications. Comparison of three phase with single phase induction motors

UNIT: V

AC commutator motors - Introduction, series motor, compensated series motor, commutating poles, universal motor, repulsion motor.

LIST OF EXPERIMENT:

1 Study of three phase induction motor (parts).
2 Measurement of slip of three phase induction motor.
3 Study of three phase induction motor starters.
4 Study of synchronous machine (parts).
5 OCC and SCC of synchronous generator and determination of regulation.
6 To plot V curves of synchronous motor.
7 Study of different single phase induction motors (construction).
8 Study of AC commutator motors (construction).
9 Study of special purpose motors (construction)

REFERENCES:

1 Electrical Machines S.K.Bhattacharya T.M.H Publishing Co. Ltd.
2 Electrical Technology- Vol-II B.L.Thereja S.Chand
3 Electrical Machinery Dr. S.K.Sen Khanna Publisher
4 Electrical Machines J.B.Gupta S.K.Kataria & Sons.
5 The performance and design of Alternating Current machines M.G.Say C.B.S Publishers & Distributors
6 Electrical Machinery P.S.Bhimbra Khanna Publisher

DEE-402. GENERAL MECHANICAL ELECTRICAL MACHINE

UNIT: I

Energy Conversion Principle: Magnetic field, Field energy, Mechanical forces and torques in singly excited and doubly excited systems, Electric field.

UNIT: II

Rotating Machines: Concepts of reluctance and electromagnetic torques, Concept of transformer and speed e.m.f`s. and torque in round-rotor machines.

UNIT:III

Transformers: Theory and operation, , Regulation, Performance estimation, Auto-transformers, Parallel operation, Three phase transformer connections, Instrument transformers: Current Transformer (CT) and potential transformer (PT); Pulse transformers.

UNIT: IV

DC Machines: Methods of excitation, Magnetization and operating characteristics of generators, Starters, Speed torque. PM motors.

Poly phase Synchronous Machines: MMF and EMF phasor, Concept of synchronous reactance, Regulation by EMF and MMF methods, Synchronous motor starting and V-curves.

UNIT: V

Induction Machine: Induction motor principle and applications as stepper and brushless motors, Induction motor equivalent circuit, Torque slip characteristics, Methods of starting, Speed control of 3□phase induction motor. **Induction Machines:** No load and Blocked rotor tests, Starters. Synchronous Machines: Regulation calculation by EMF method.

REFERENCES:

1. *Bimbhra, P.S., Electrical Machinery, Khanna Publishers (2008) 2nd ed.*
2. *Mukherjee, P.K. and Chakravorty, S., Electrical Machines, Dhanpat Rai and Co. (P) Ltd. (2004) 2nd ed.*
3. *Nagrath, I.J and Kothari, D.P., Electric Machines, Tata McGraw Hill (2004) 3rd ed*

DEE-403. ELECTRICAL ENGINEERING DRAWING

UNIT: I

Symbols and Notations - Symbols of practical units, multiples and submultiples, types of supplies, single phase, three phase three wire, three phase four wire, D.C. supply etc. Accessories like main switches, distribution boards, fans, light fixtures, bell , buzzer, lighting arrestor. All types of motor starters, instruments, electronic components etc. Rating plate of machines.

UNIT: II

Domestic Wiring - All types of light circuits: Fluorescent tube circuits, intermediate switch circuits, fan circuits. Wiring of a residential building. Sodium vapor lamp, mercury vapor lamp. Instrument Circuits - Connection of meters in circuits. Ammeter, voltmeter, wattmeter, energy meter, Power factor meter, frequency meter, synchroscope etc. Extension of range using shunt, multiplier, current transformer, potential transformers etc. Winding Diagrams - Simplex type lap and wave diagrams for D. C. Machines. Single phase and three phase motor winding diagrams.

UNIT: III

Electrical Machine Drawing - Parts of D.C. machines like, magnetic poles, commutated, armature etc. A.C. machines rotor, slip rings, etc. Various cable sections. Bushing of the transformer. Assembly diagrams of D.C. machine, A.C. machine, and transformer.

UNIT: IV

. Power Wiring - Internal wiring diagrams of single phase motor. wiring diagrams of D.C. and A.C. motor starters like three point shunt motor starter, four point compound motor starter, direct on line (D.O.L.) starter, star- delta starter, contactor type and auto transformer starter. Internal connections of D.C. series, shunt and compound motors. Three phase motors: squirrel cage, slip ring, synchronous etc. Plate earthling and Pipe earthling as per I.S.S

UNIT: V

Alternator Panel Diagrams - Panel diagram with circuit breaker, isolator, measuring instruments, syncho scope. Over current and earth fault protection, differential protection, voltage regulator etc.

.

LIST OF EXPERIMENTS:

1. WIRING DIAGRAM AND CONTROL CIRCUIT

2. DRAW D.C. MACHINEPARTS (Dimensional Drawing)

3. DRAW A.C. MACHINE PARTS (Dimensional Drawing)

4. DRAW 1-PHASE & 3-PHASE TRANSFORMER (Assembly Drawing)

5. DRAW SINGLE LINE DIAGRAM OF SUBSTATION

6. DRAW DIMENSIONAL DRAWING OF VARIOUS PARTS OF 3-PHASE

7. COMPUTER AIDED ELECTRICAL DRAWING USING SOFT WARE

REFERENCES:

(1) A text book of Electrical Drawing by S.L. Uppal (Khanna pub.)

(2) Electrical Drawing by K.L. Narang.

DEE-404. GENERATION TRANSMISSION AND DISTRIBUTION

UNIT:I

Non Conventional Sources Of Energy Concept and need of primacy between conventional and non solar , wind, biogas, ocean, tidal, geothermal, fuel cell , MHD and their practical applications.

.

.

UNIT: II

Conventional Sources Of Energy Detailed study of generating stations diagram, site selection main components and auxiliaries for above power stations. Study of gas turbines plant and diesel power plant. Advantages,disadvantages of thermal hydro,power plant

UNIT: III

Types of Tariff, flat rate, block rate, two part, maximum demand and power factor tariff. Their meritsand demerits. Simple problems on above terms. Concept of Transmission, single line standard voltages of A.C. Transmission, efficiency (no derivation). H.V.D.C. transmission system, line diagram, advantages and Disadvantages of H.V.D.C transmission line, supports, type of joints, looms, earth wires, ground wire and vibration dampers. Importance of R,L,C in transmission line (no derivation), skin effect, transposition, corona, advantages and disadvantages of
methods of reducing corona, types of insulators, string efficiency andvoltage distribution, grading ring and Arcing horn.

UNIT: IV

Types of Transmission line, T and line, transmission efficiency, Ferranti effect medium Transmission line. Difference between overhead line and underground cables. Classification and construction of L.T. and H. T. cables, Methods of laying.

UNIT: V

Classification of distribution system, ring main, radial and interconnected system. Concept of feeder, distributor and service mains in distribution system. Simple problems.

LIST OF EXPERIMENTS:

1. To prepare chart to showing various factors affecting entrepreneurship
2 Study of solar cooker.
3 Study of solar water heater.
4 Study of solar photo-voltaic cells.
5 Study of wind mill.
6 Study of Bio Gas plant.
7 Study of steam power plant, hydro power plant, nuclear power plant.
8 Study of line supports and insulators.
9 Determination of string efficiency of insulator string.
10 Performance of short/ medium transmissions line.

REFERENCE BOOK:

1. Non Conventional energy sources By G.D. Rai, Khanna publisher
2. Electrical Power By S.L.Uppal, Khanna publisher
3. Electrical Power By J.B. Gupta Power System By V.K. Mehta

DEE-405. ENTREPRENEURSHIP

UNIT: I

Introduction to Entrepreneurship : Definition of Entrepreneur / Entrepreneur, Difference between, Need for Entrepreneurship, qualities of successful entrepreneur, Myths about Entrepreneurship, Classification of entrepreneurs on the basis of different criteria, Reasons for the failure of entrepreneurs .

UNIT: II

Industries and Business Organization : Concept of Industry or Enterprise, Classification of Industries,
(a) On the basis of capital investment,
- Tiny (Micro) Industry
- Small Scale
- Medium Scale
- Large Scale

(b) Others
- Rural Industry
- Cottage Industry

(c) Forms of Business Organization
- Proprietorship
- Board & Co
- Partnership
- public Ltd.
- Private Ltd.
- Jt. Sector
- Government Co

UNIT: III

Institutional Assistance:
(a) Types of Institutional assistance
- Infra
- Technical
- Financial assistance
- Marketing Assistance

(b) Information / guidance & Training
- SISI
- MPCON
- CED- MA

(c) Infrastructure
- D/C -

(d) Finance
- SIDBI-
- NABARD

M.P.A.V.V.N.

UNIT: IV

Planning of Industrial Unit

(a) Pre- Planning Stage
- Scanning the environment
- Market survey
- Seeking information
- product / project selection

(b) Implementation Stage
- PPR Preparation
- DIC registration
- Arrangement of Land
- Arrangement of Power
- Obtaining NOC / Licenses from various Deptt.
- DPR Preparation
- Seeking financial assistance
- Commercial Production

(c) Post Implementation stage
- Permanent registration from D.I.C.
- Availing Subsidies
- Diversification / Modification
- Setting up of marketing channel / Distribution.

UNIT: V

Achievement Motivation: Historical perspective, Concept of achievement motivation, Significance of achievement motivation, Development of achievement motivation .

REFERENCE BOOKS:

1. Entrepreneurial Development
2. CEDMAP (Center of Entrepreneurial development Madhya Pradesh)
3. Udyamita Vikas by Anand Prakashan