

M-SCHEME DETAILED SYALLABUS

33061 DISTRIBUTION AND UTILIZATION

UNIT I DISTRIBUTION

Substation

Introduction-Sub stations-classification of sub stations-Indoor and outdoor S.S – Gas insulated S.S-comparisons-Layout 110/11KV Substation and 11KV/400V Distribution Substation-substation equipment's-Bus bar- Types of bus bar arrangement -Advantages and Disadvantages.

Distribution

Distribution system-Requirements of a Distribution system-part of Distribution system- classification of Distribution systems-comparison of different distribution systems (A.C and D.C) -A.C Distribution –Types connection schemes of Distribution system-A. C Distribution calculations-Calculation of voltage at load points on single phase distribution systems (With concentrated load only)- Distribution fed at one end, both ends and ring mains-problems- Three phase, four wire, Star connected unbalanced load circuit- Problems- consequence of Disconnection of Neutral in three phase four wire system (illustration with an example)

UNIT II INDUSTRIAL DRIVES

Introduction-Electric drive- Advantages-parts of Electric drives-Transmission of power-Types of Electric drives-Individual, group and multi motor drives – Advantages and disadvantages of Individual and group drive -Factors governing the selection of motors-Nature and classification of load Torque-Matching of speed Torque characteristics of load and motor-Standard ratings of motor- classes of load duty cycles-Selection of motors for different duty cycles-Selection of motors for specific application-Braking- Features of good braking system- Types of Braking - Advantages of - Electric braking-Plugging, Dynamic and Regenerative braking-As applied to various motors.

UNIT III ELECTRIC TRACTION

Introduction-Traction systems-Advantages and Disadvantages of Electric Traction

System of Track Electrification

Methods of supplying power-Rail connected system and overhead system-O.H. equipment's -contact wire, centenary and droppers- Current collection gear for OHE-Bow and pantograph collector-Different systems of Track Electrification-Advantages of single phase low frequency A. C. system-Booster Transformer-Necessity- Methods of connecting B.T-Neutral sectioning.

Traction Mechanics

Units and notations used in Traction mechanics-Speed time curve for different services - simplified speed time curve-Derivation of maximum speed-crest speed, Average speed, Schedule speed (definitions only)-Tractive effort and power requirement- Specific energy output- specific energy consumption. Traction motors and control: Desirable characteristics of Traction motors-Motors used for Traction purpose-Methods of starting and speed control of D.C Traction motors-Rheostatic Control-energy saving with plain rheostatic control series-parallel control- Energy saving with series parallel starting - Shunt Transition -Bridge-Transition- multiple unit control –Regenerative braking. Recent trends in Electric Traction-Magnetic Levitation (MEGLEV) - Suspension systems.

UNIT IV ILLUMINATION

Introduction - Definition and units of different terms used in illumination-plane Angle, Solids angle, Light, Luminous flux, Luminous Intensity, Luminous Efficacy candle power, Lumen, Illumination M.S.C.P, M.H.C.P, M.H.S.C.P- Reduction factor, Luminance, glare Lamp efficiency. Space-height ratio, Depreciation factor Utilization factor, waste light factor, Absorption factor, Beam factor, Reflection factor-Requirements of good lighting system- Laws of Illumination-problems. Types of lighting scheme- Factors to be considered while designing

For Notes, Syllabus, Question Papers and Many more

lighting scheme- Design of lighting Scheme (Indoor and outdoor)- Problems- Lighting systems- Factory lighting, Flood lighting, Street lighting.

Sources of light-Arc lamp, Incandescent lamp, Halogen Lamp, Sodium vapour lamp, High pressure mercury vapour lamp, Fluorescent Tube –Induction Lamp- Energy saving lamps (C.F.L and L.E.D lamps)-limitation and disposal of C.F.L-benefits of led lamps comparison of lumen output for led CFL and incandescent lamp.

UNIT V ELECTRIC HEATING AND WELDING

Electric Heating

Introduction -Advantages of Electric heating-modes of heat transfer- classification of Electric Heating - Power frequency electric heating- Direct and Indirect resistance heating-Infrared heating-Arc heating –High frequency Electric heating- Induction heating-Induction Stove –Eddy current heating and Dielectric heating.

Electric furnaces

Resistance furnace-Requirements of Heating elements commonly used heating element materials-Resistance furnace for special purposes-Temperature control of resistance furnace-Arc furnace -Direct and Indirect Arc furnace- Temperature control of Arc furnace Reasons for employing low voltage and high current supply - Induction furnace-Direct and Indirect core type Induction furnace-coreless Induction furnace-Power supply for coreless Induction furnace.

Electric welding

Introduction-Types of Electric welding-Requirements of good weld-Preparation of work -Resistance welding- Butt welding, Spot welding, Seam welding, Projection welding and Flash welding-Arc welding- Carbon Arc welding, metal Arc welding, Atomic hydrogen Arc welding, Inert gas metal arc welding-Comparison between Resistance and Arc welding Radiation welding - Ultrasonic welding, Electron beam welding, LASER beam welding-Electric welding equipment's (A.C. and D.C).

TEXT BOOK

A Course in Electrical Power Soni & Gupta Dhanpat Rai & Sons, Delhi.

REFERENCE BOOKS

1. Electric Power SL Uppal Khanna Publishers, New Delhi
2. Modern Electric Traction H Partab Dhanpat Rai & Sons, New Delhi
3. Electrical Power Distribution System AS Pabla Tata McGraw Hill Publishing Co, New Delhi
4. Utilization of Electric Power NV Suryanarayana Tata McGraw Hill Publishing Co, New Delhi.