2.6 40456 UTILIZATION OF ELECTRICAL ENERGY

UNIT-1 ILLUMINATION

1.1 Nature of light, curve of relative sensitivity of human eye and wave length

1.2 Definition, flux, solid angle, luminious intensity, illumination, illumination efficiency, depreciation factor, coefficient of utilization, space to height ratio also, reflection factor, laws of illumination factor

1.3 Calculation of number of light points for interior illumination, Calculation of illumination at different points; considerations, involved in simple design problems and illumination schemes;

1.4 Indoor and outdoor illumination level Different sources of light

1.5 Different Incandescent and discharge lamps – their construction and characteristics, fittings required for filament lamp, mercury lamp, fluoroscent lamp, sodium lamp, neon lamp, halogen lamps, contact flouroscent lamp Main requirements of proper lighting

1.6 Absence of glare, contrast and shadow, Principles of street lighting.

UNIT-2 ELECTRIC HEATING

2.1 Introduction Advantages of electrical heating heating methods Resistance heating (direct resistance heating, indirect resistance heating, electric ovens, their temperature range)

2.2 Properties of heating elements, domestic water heaters and other heating appliances Induction heating;

2.3 Principle; core type and coreless induction furnace Electric arc heating, direct and indirect arc heating;

2.4 Arc furnace Dielectric heating.

2.5 Applications in various industrial fields Simple design problems of Resistance heating element

UNIT-3 ELECTRIC WELDING

3.1 Welding methods, Principles of resistance welding, welding equipment

3.2 Principle of arc production, electric arc welding principle

3.3 Characteristics of arc; carbon and metallic arc welding, power supply

3.4 Advantages of coated electrode,

3.5 Comparision of AC and DC arc welding, welding control and welding control circuits

UNIT-4 ELECTROCHEMICAL PROCESSES

4.1 Need of electro-deposition

4.2 Applications of Faraday's laws in electro-deposition

4.3 Objectives of electroplating Factors governing electro deposition

4.4 Equipments and accessories for electroplating plant

4.5 Principle of anodizing and its applications

4.6 Electroplating on non-conducting materials

UNIT-5 ELECTRICAL CIRCUITS

5.1 Used in Refrigeration and Air Conditioning and Water Coolers

5.2 Brief description of vapour compression refrigeration cycle
5.3 Description of Electrical circuit used in
a) Refrigerator
b) Air-conditioner, and
c) Water cooler

UNIT-6 ELECTRIC DRIVES

6.1 Advantages of Electric Drives
6.2 Characteristics of different mechanical loads Types of motors used in electric drive
6.3 Electric braking:
a) Plugging
b) Rheostatic breaking
c) Regenerative breaking
6.4 Methods of power transfer by devices like belt drive, gears, pulley
6.5 Examples of selection of motors for particular loads
6.6 Applications such as general workshop, textile mill, paper mill, steel mill, printing press, crane and lift
6.7 Applications of commonly used motors (squirrel cage induction motors, slip ring induction motors, AC series motors)

UNIT-7 ELECTRIC TRACTION

7.1 Advantages of electric traction
7.2 Different systems of electric traction, DC and AC system
7.3 Different systems for track electrification; such as overhead wires, conductor rail system, current and collector-pentagraph
7.4 Electrical block diagram of an electrical electromotive with description of various equipments and accessories breaking of traction motors

Reference Books:

1. Utilization of electric power & electric traction by J.B.Gupta