EES-806: Utilization of Electrical Energy

Credit	L	T	P
4	**3**	**1**	**-**

UNIT-I

Introduction, general features, track specification, arrangement of locomotive drives, transmission of power from motor to driving wheel. Mechanics of train movement, speed-time curves, tractive effort for acceleration and propulsion, power and energy output from driving axis.

UNIT-II

Train resistance, adhesive weight, and coefficient of adhesion, Feeding and distributing system for tramways and railways, Track arrangements, collector gears and auxiliary equipments, Diesel-electric equipments, characteristics, transmission of drive, electric transmission. Review of traction motors and their control, comparative features of ac and dc traction. Recent trends in electric traction, Magnetic Levitation Systems.

UNIT-III

Nature of light, definitions, units, basics laws of illumination, determination of luminous flux, Light sources and their characteristics, light production by excitation and ionization, incandescence and fluorescence, sources of light- filament lam, halogen lamp, discharge lamp, fluorescent lamp, incandescent lamp, arc lamp and their applications, Direct lighting and mixed reflection, reflection factor, transmission factor, refractors, lighting fitting, street lighting, exterior and interior lighting.

UNIT-IV

Advantages of electric heating, resistance heating, types of furnaces, types of heating materials, temperature control of furnaces, variable voltage supply, design of heating element, arc furnace, induction heating, dielectric heating, microwave oven.

UNIT-V

Welding- classification, electric supply, for arc welding, welding transformer, welding techniques, Electrolytic Process- Basic principles, electrodeposition, electrolysis, electric supply for electrolysis.

TEXT/REFFERENCE BOOKS

1. H. Partab, Art and science of utilization of electrical energy, Pritam, Surat and brothers, New Delhi.
2. N. N. Hancock, Electric power utilization, Wheeler Publications, Allahabad.
3. Soni, Gupta and Bhatnagar, Electric power utilization, Dhanpat Rai and sons, New Delhi.
4. E. Openshaw Taylor, Utilization of electrical energy, Orient Longman Publishers.
5. C. L. Wadhwa, Generation, distribution and utilization of electric energy, New Age Publications, New Delhi.