EE30024 ILLUMINATION AND ELECTRICAL SERVICES

Part I – Basics of Electrical Engineering

Introduction: Sources of energy; General structure of electrical power systems.

DC Networks: Kirchoff's laws, node voltage and mesh current methods,

Single phase AC Circuits: Single phase EMF generation, average and effective values of sinusoids, solution of R,L,C series circuits, the j operator, complex representation of impedances, phasor diagram, power factor, power in complex notation, solution of parallel and series – parallel circuits.

Three phase AC Circuits: Three phase EMF generation, delta and Y – connections, line and phase quantities, solution of three phase circuits, balanced supply voltage and balanced load, phasor diagram,

Transformers: Construction, EMF equation, ratings, phasor diagram on no load and full load, equivalent circuit, regulation and efficiency calculations, open and short circuit tests, auto-transformers.

Grounding, Earthing and Lightning Protection

Part II – Illumination Engineering

Radiation and colour. • Eye and vision. •

Laws of illumination; illumination from point, line and surface sources. • Photometry and spectrophotometry, photocells.

Different entities of illuminating systems. • Light sources: daylight, incandescent, electric discharge, fluorescent, arc lamps, Lasers and LEDS. •

Environment and glare

Luminaries, wiring, switching and control circuits.

General illumination design.

• Interior lighting – industrial, residential, office departmental stores, indoor stadium, theater and hospitals.

• Exterior lighting – flood, street, aviation and transport lighting, lighting for displays and signaling – neon sign's, LED – LCD displays beacons and lighting for surveillance.