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## **PEL6D004 UTILIZATION OF ELECTRICAL ENERGY (HONOR) [(4-0-0)]**

### **UNIT I: ELECTRIC DRIVES**

Basic concept of electric drives, choice of electric drives, fundamental torque equation, speedtorque converter and multi quadrant operation, equivalent values of drive parameters, concept of load torque, calculation of time and energy loss in transient operation, steady state stability and load equalization,types of industrial loads, continuous, intermittent and variable loads,Review of torque speed characteristics of AC and DC motors.

### **UNIT II: ILLUMINATION**

Production of light - lighting calculations - determination of MHCP and MSCP - Polar curves of different types of sources - Rousseau's construction - photometers - interior and exterior illumination systems - lighting schemes - Design of lighting schemes - factory lighting - flood lighting - electric lamps - gaseous discharge lamps

### **UNIT III: HEATING AND WELDING:**

Salient features of electric heating, resistance heating, induction heating, electric arc heating, methods of generating high frequency power.Arc Furnaces - Construction and fields of application - control equipment, Electric welding, resistance and arc welding, control devices and welding equipment, butt welding, spot welding. ;

### **UNIT IV: ELECTRIC TRACTION**

System of electric traction and track electrification. Review of existing electric traction systems in India. Special features of traction motor, methods of electric braking- plugging rheostatic braking and regenerative braking. Mechanics of train movement. Speed-time curves for different services – trapezoidal and quadrilateral speed time curves.Recent trend in electric traction

### **TEXT BOOKS:**

1. Utilisation of Electric Energy – by E. Openshaw Taylor, Orient Longman.
2. Art & Science of Utilization of electrical Energy – by Partab, Dhanpat Rai & Sons.

### **REFERENCE BOOKS:**

1. Utilization of Electrical Power including Electric drives and Electric traction – by N.V.Suryanarayana, New Age International (P) Limited, Publishers, 1996.
2. Generation, Distribution and Utilization of electrical Energy – by C.L. Wadhwa, New Age International (P) Limited, Publishers, 1997.
3. S. C. Tripathy, Electric Energy Utilisation and Conservation, Tata McGraw Hill, 1991.
4. W. F. Stocker and J.W. Jones, Refrigeration & Air Conditioning, McGraw Hill, 1985.

Supplementary Reading:

5. N.V. Suryanarayana, Utilisation of Electric Power, Wiley Eastern Ltd., 1993.

