Code No: **R32023**

R10

III B.Tech II Semester Supplementary Examinations, Dec - 2015
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time: 3 hours   **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1 a) What is Load Equalization? Explain its importance with an example. [7]
  b) Explain the different factors that govern the selection of motors for various applications. [8]

2 a) What do you understand by electric heating? What are its advantages over other methods of heating? [7]
  b) A low frequency induction furnace operating at 230 V in the secondary circuit takes 500 KW at 0.5 power factor when the hearth is full. If the secondary voltage be maintained at 230 V, estimate the power absorbed and the power factor when the hearth is half full. Assume the resistance of the secondary circuit is there by halved and reactance to remains the same. [8]

3 a) Compare and contrast AC and DC welding. [7]
  b) Explain about Seam welding and Butt welding. Mention their applications. [8]

4 a) Define the following : [7]
      (i) Plane and solid angle (ii) Luminous Intensity (iii) Rousseau Diagram.
  b) Six lamps are used to illuminate a certain room. If the luminous efficiency of each lamp is 11 lumens/watt and the lamps have to emit a total lux of 10,000 lumens, calculate (i) the mean spherical luminous intensity (ii) the cost of energy consumed in 4hours if the charge for electrical energy is 50 paise per unit. [8]

5 a) Discuss the various designs of lighting schemes and factors to be considered for proper lighting. [7]
  b) Explain the structure and operation of Sodium Vapor lamp. [8]

6   With the help of trapezoidal speed time curve, derive an expression for the maximum speed and hence estimate the values of acceleration and retardation [15]

7 a) Define coefficient of adhesion, dead weight and adhesive weight. Explain the factors which influence the value of coefficient of adhesion. [7]
  b) An electric train has an average speed between start to stop, Va = 40km/hr, acceleration 2.4km/hr/sec and retardation 4 km/hr/sec, specific tractive resistance 55 newton/tonne and average motor efficiency 75%. Estimate the average consumption of energy over a run of 800m, assuming trapezoidal speed time curve. Add 8% for the rotational inertia. [8]

8   Explain the energy efficiency techniques of Demand side management in detail. Discuss their significance. [15]

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