GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – II • EXAMINATION – WINTER • 2013

Subject code: 1720711   **Date: 04-01-2014**
Subject Name: Electrical Power Utilization
Time: 10.30 am – 01.00 pm   **Total Marks: 70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** What are the advantages of electrically produced heat and explain principle of dielectric heating.   **07**

      (b) Explain design consideration of heating element.   **07**

Q.2 **(a)** Explain indirect core type induction furnace.   **07**

      (b) A 30 KW , 400 volts resistance oven is to employ nickel strip 0.254 mm thick for 3 delta connected heating elements. If wire temperature is 1100 centigrade and that of charge is 700 centigrade. Estimate suitable width for the strip. Assume emission = 0.9, radiation efficiency= 0.5. What would be the temperature of the wire when the charge is cold ?   **07**

OR

      (b) State and explain the laws of illumination.   **07**

Q.3 **(a)** Explain the terms (1) Illumination (2) Luminous intensity (3)Glare (4) Brightness   **07**

      (b) The illumination of drawing office 30m x 10m is to have a value of 250 lux and is to be provided by number of 300 watt filament lamps. If the utilization factor is 0.4 and depreciation factor is 0.9, determine no. of lamps required. The efficiency of each lamp is 14 lumens per watt.   **07**

OR

Q.3 **(a)** Explain Quadrilateral and trapezoidal speed- time curve.   **07**

      (b) Explain typical speed – time curve of sub-urban area.   **07**

Q.4 **(a)** State and explain faraday's law of electrolysis.   **07**

      (b) Explain briefly different applications of electrolysis.   **07**

OR

Q.4 **(a)** Explain air-conditioner with suitable circuit diagram.   **07**

Q.4 **(b)** Explain electric circuit of refrigerator.   **07**

Q.5 **(a)** Explain regenerative braking used in traction system.   **07**

      (b) Explain electro deposition processes and discuss various factors governing the electro deposition processes   **07**

OR

Q.5 **(a)** Explain mercury vapour lamp with circuit diagram.   **07**

      (b) Explain the general features of traction.   **07**

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