

Total No. of Questions :6]

SEAT No. :

P84

APR. -16/TE/Insem. - 16

[Total No. of Pages :2

T.E.(Electrical)

UTILIZATION OF ELECTRICAL ENERGY

(2012 Course) (Semester - II)

Time : 1Hour]

[Max. Marks :30

Instructions to the candidates:

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*
- 5) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

- Q1) a)** Explain the various ways in which the temperature of resistance furnace can be controlled. **[4]**
- b) A 50 kW three phase, 440 V resistance oven is to be provided with three, star connected heating elements of thickness 0.3 mm. If the temperature of heating element is to be limited to 1500° C and that of the charge is to be 1000° C. Calculate suitable length and width of strip. Take resistivity of material for heating element as $1.016 \times 10^{-6} \Omega \text{ m}$, emissivity as 0.91 and radiant efficiency as 0.6. **[6]**

OR

- Q2) a)** With suitable diagram explain Direct and Indirect Arc heating. **[4]**
- b) Estimate efficiency of a high frequency Induction furnace which takes 11 minutes to melt 2 Kg of Aluminum. The input to the furnace being 4KW and initial temperature 18°C. Specific heat of Aluminum = 880 J/Kg/°C, melting point of Aluminum = 660°C, latent heat of fusion of Aluminum = 32 kJ/kg, $1 \text{ J} = 2.78 \times 10^{-7} \text{ kWh}$. **[6]**
- Q3) a)** State Faradays laws of electro-deposition. Explain the need for electro-deposition. **[4]**
- b) With a suitable diagram explain electric circuit used in Refrigerator. **[6]**

OR

P.T.O.

Q4) a) Write a short note on Anodizing. **[4]**

b) Explain construction, working of Contactor & Relay. **[6]**

Q5) a) Define: **[4]**

i) Illumination ii) Depreciation factor

iii) Reflection factor iv) Candle Power

b) An illumination at a point on a working plane directly below the lamp is to be 100 lumens/m². The lamp gives 256 CP uniformly below the horizontal plane. **[6]**

Determine:

i) The height at which lamp is suspended.

ii) Illumination at a point on the working plane 1.2 meter away from the vertical axis of the lamp.

OR

Q6) a) With neat diagram explain Metal Halide lamp. **[4]**

b) A hall measuring 20 m × 15m is to be illuminated by suitable lamps to give an average illumination of 45 lux. The following data may be used. Mounting height from working plane = 3m, coefficient of utilization = 0.5, depreciation factor = 1.3. The lamps are to be chosen from the following group. Calculate number of lamps of each type. **[6]**

Watt	75	100	150	200
Lumen	800	1200	2000	2800

