SEAT No. :

P3633

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APR-15/ENGG.-118

T.E. (Electrical) (In Sem - Semester - II)

UTILIZATION OF ELECTRICAL ENERGY

(2012 Pattern)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) *Answer Q1 OR Q2, Q3 OR Q4, Q5 OR Q6.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Assume suitable data, if necessary.*
4) *Figures to the right indicate full marks.*

Q1) a) Explain any four advantages of an Electrical heating. **[4]**

b) A resistance oven employing nichrome wire is to be operated from 220 V, single phase supply and is to be rated at 16 kW. If the temperature of the element is to be limited to 1170 ⬜ C and average temperature of the charge is 500 ⬜ C. Find the diameter and length of the element wire. Radiating efficiency = 0.57, emissivity = 0.9, specific resistance of nichrome = 109×10^{-8} Ωm. **[6]**

OR

Q2) a) Describe Ajax Wyatt induction furnace with neat diagram. **[4]**

b) A piece of insulating material is to be heated by dielectric heating. The size of the piece is 12 cm × 12 cm × 3cm. A frequency of 20 mega cycles is used and the power absorbed is 450 watt. Calculate the voltage necessary for heating and the current flowing through the material. The material has relative permittivity of 5 and power factor of 0.05. If the voltage were limited to 1700 V, what will be the frequency to get the same loss. **[6]**

Q3) a) Explain vapour compression refrigeration cycle with neat diagram. **[4]**

b) Explain factors on which the quality of Electro – Deposition depends.**[6]**

P.T.O.

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

b)   With a suitable diagram explain electric circuit used in refrigerator.   **[6]**

Q5) a)   Define following terms and state its unit.   **[4]**

   i)   Luminous Flux

   ii)   Luminous Intensity

   iii)   Solid Angle

   iv)   Coefficient of Utilization

b)   Two lamps are suspended at a height of 9 meter from the floor level. The distance between the lamps is 2 meter. Lamp one is of 500 candle power. If the illumination on the floor vertically below this lamp is 20 lux. Find the candle power of the lamp two.   **[6]**

OR

Q6) a)   Explain Sodium Vapour lamp with neat diagram.   **[4]**

b)   A lamp with a reflector is mounted 12 meter above the centre of a circular area of 24 meter diameter. If the combination of the lamp and reflector gives a uniform CP of 1000 over the circular area, determine the maximum and minimum illumination produced on the area.   **[6]**

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