Total No. of Questions : 6]

SEAT No. :

P180

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APR - 17/TE/Insem. - 16

T.E. (Electrical Engineering)

UTILIZATION OF ELECTRICAL ENERGY

(2012 Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Explain various methods of producing heat. **[4]**

b) A laminated wooden board 0.3m long by 0.15m wide and 0.025m thick is to be heated to 160ºC in 10 minutes by dielectric heating employing a frequency of 30MHz. The wood has a specific heat of 1465J/Kg/ºC, a weight of 575Kg/m^3, a permittivity of 5 and a power factor of 0.05. Determine the power required, the voltage across the wood and the current through it, during the heating process. **[6]**

OR

Q2) a) Explain the methods for varying the current in the heating elements. **[4]**

b) A 20kW single phase 220volts resistance oven employed a circular nichrom wire for its heating element. If wire temperature is not to exceed 1170ºC and temperature of change is to be 500ºC. Calculate diameter and length of wire. Radiating efficiency 57%, emissivity 0.95 and resistivity of material for heating element as 109 $\mu\Omega$-cm. **[6]**

Q3) a) State Faradays laws of electro-deposition and explain the need for it. **[4]**

b) Explain with neat diagram basic principle of electro-deposition. **[6]**

OR

Q4) a) Write short note on: **[6]**

i) Push button

ii) Float switch

iii) Electromagnetic contactor

b) Explain in brief Anodizing. **[4]**

P.T.O.

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

i) Luminous intensity

ii) Co-efficient of utilization

iii) Space to height ratio

iv) Candle power.

b) Four lamps are hung at a height of 10m from the floor in corner of a square of 20m × 20m if each lamp is of 400CP. Calculate the illumination on the floor at the centre of the square. **[6]**

OR

Q6) a) Differentiate between neon lamp and discharge lamp. **[4]**

b) An illumination on the working plane of 75 lux is required in a room 72m × 15m in size. The lamps are required to be hung 4m above the working bench. A UF of 0.5, a lamp efficiency of 14 lumens/watt and a CP depreciation of 20%. Estimate the number, rating and disposition of lamp. **[6]**