Total No. of Questions : 6]

SEAT No. :

P517

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APR - 18/TE/Insem. - 117

T.E. (Electrical)

UTILIZATION OF ELECTRICAL ENERGY

(2015 Course) (Semester - II)

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

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6.***
2) ***Figures to the right indicate full marks.***

Q1) a) What properties should be possessed by a good heating element and what are various reasons of heating element failure? **[4]**

b) A 40 kW, 3 phase, 400 V resistance oven is to employ Ni-Cr strip of 0.3 mm thickness. The heating elements are connected in delta, if the temp of wire to be 1200ºC and that of charge is 700ºC. Determine length and width of wire. Take radiation efficiency 0.5, emissivity as 0.9 & specific resistance as $1.03*10^{-6}$ Ωm. **[6]**

OR

Q2) a) Write a short note on Spot welding with neat sketch. **[4]**

b) The power required for dielectric heating of slab of resin, 150 cm^2 in area and 2 cm thick is 200 W at frequency of 30 MHz. The material has a relative permittivity of 5 and p.f. 0.05. Find the voltage necessary and current through material. If voltage is limited to 700 V, what will be the frequency to obtain same heat? **[6]**

Q3) a) If 17.5 gm of nickel is deposited by 90 A current flowing for 9 min. How much copper would be deposited by 45 A current in 5 min? The atomic weight of Nickel = 58.6 and that of Copper = 63.18. Valency of both is 2. **[4]**

b) Draw an electric circuit diagram used in Air Conditioning and Explain in brief. **[6]**

OR

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Q4) a) What is a need of electro-deposition and factors governing electro-deposition? **[4]**

b) Explain Vapour compression cycle used in refrigeration system and write difference between Vapour compression and Vapour evaporation cycle. **[6]**

Q5) a) Compare Incandescent lamp and Gas Discharge lamp. **[4]**

b) A hall of 25 * 20 meter area with a ceiling height of 6 m is to be provided with general illumination of 300 Lux, taking a coefficient of utilization of 0.8 and depreciation factor of 1.4. Determine the no. of tubes required considering suitable space to height ratio. Take luminous efficiency of tube 25 lumens/w for 300 W tube and show the arrangement. **[6]**

OR

Q6) a) Explain Flood lighting scheme in brief. **[4]**

b) Two lamps having uniform intensity 500 CP in all directions are mounted at height of 10 m from ground and are separated by a distance of 20 m apart. Find the illumination at a point on ground 12 m from first lamp. **[6]**

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