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SEAT No. :

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P16

APR - 18/TE/Insem. - 18

T.E. (Electrical)

UTILIZATION OF ELECTRICAL ENERGY

(2012 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) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Assume suitable data, if necessary.*

Q1) a) Explain principle of Direct & Indirect arc heating. **[4]**

- b) A piece of plastic material of size $4 \times 2 \times 1$ cm is heated. The frequency of 20 MHz is impressed across the electrodes. If the power consumed is 80 watts. Find the voltage applied across the electrodes and current through the material. Assume relative permittivity as 5 and power factor as 0.05. **[6]**

OR

Q2) a) What are the desirable properties the material for heating should have? Name a few materials used for heating. **[4]**

- b) 1.5 tonnes of brass is to be heated in a three phase induction furnace. Find the average input power if the melt is to be carried out in $1\frac{1}{4}$ hours. Room temp. = 20° C, specific heat of brass = 393.6 J/kg/ $^\circ$ C, latent heat of fusion = 163×10^3 J/kg, melting point of brass = 920° C & furnace efficiency 70%. **[6]**

Q3) a) Write a note on Anodizing. **[4]**

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

OR

P.T.O.

- Q4) a)** Write a short note on Anodizing. [4]
- b) Explain factors affecting quality of Electro - Deposition. [6]

- Q5) a)** Define : [4]
- i) Illumination
 - ii) Depreciation factor
 - iii) Space Height Ratio
 - 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. Determine [6]
- 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 a neat diagram explain Metal halide lamp. [4]
- b) A hall measuring 20 m × 15 m 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 = 3 m, 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

