

Total No. of Questions : 6]

SEAT No. :

P1439

[Total No. of Pages : 2

**TE/Insem/APR-116**  
**T.E. (Electrical)**  
**UTILIZATION OF ELECTRICAL ENERGY**  
**(2015 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 diagrams must be drawn wherever necessary.*
- 3) *Assume suitable data if necessary.*
- 4) *Figures to the right side indicate full marks.*

**Q1) a)** State applications of dielectric heating. **[4]**

- b) A star connected resistance heating element strip of capacity 42 KW, operating on 3 phase, 415 volt, 50 Hz has a thickness of 0.4 mm.. If the temperature of heating element is to be limited to 1350°C and that of the charge is to be 900°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 0.88 and radiant efficiency as 0.65. **[6]**

OR

**Q2) a)** With suitable diagram explain construction and working of Ajax wyatt induction furnace. **[4]**

- b) A low frequency induction furnace operating at 12 volt takes 480 kW at 0.5 pf lag when hearth is full.If the secondary voltage is to be maintained at 12 volt, find the power factor and power absorbed when hearth is 50% full. The resistance of secondary circuit is 50 % and reactance to remain same. **[6]**

**Q3) a)** With a suitable diagram explain electro refining process. **[4]**

- b) Compare vapour compression and vapour absorption system in refrigerator. **[6]**

**P.T.O.**

OR

- Q4)** a) Write a short note on Anodizing. [4]  
b) Explain with diagram vapour compression system used for refrigeration. [6]

- Q5)** a) Define. [4]  
i) Reduction factor  
ii) Depreciation factor  
iii) MHCP  
iv) Space to height ratio

- b) A light source of 100 watt with MSCP 2500 is suspended 3 meter above the working plane. Find the following : [6]  
i) Illumination in lux directly below the lamp on working plane.  
ii) Lamp efficiency in lumens/watt  
iii) Illumination 3 meter away on the horizontal plane below the lamp

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 Sodium vapour 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

