

**Utilization of Electric Energy**

P. Pages : 2

Time : Three Hours



**KNT/KW/16/7334**

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
  2. Solve Question 1 OR Questions No. 2.
  3. Solve Question 3 OR Questions No. 4.
  4. Solve Question 5 OR Questions No. 6.
  5. Solve Question 7 OR Questions No. 8.
  6. Solve Question 9 OR Questions No. 10.
  7. Solve Question 11 OR Questions No. 12.
  8. Assume suitable data whenever necessary.
  9. Diagrams and chemical equations should be given whenever necessary.
  10. Illustrate your answers whenever necessary with the help of neat sketches.
  11. Use of non programmable calculator is permitted.

1. a) What are the desirable properties of heating element material? Explain the design procedure of the heating element when the voltage and electrical energy input is known. **8**

b) What are the advantages of electric heating over other forms of heating. **6**

**OR**

2. a) Explain the principle of Dielectric heating with its applications and advantages. **6**

b) Describe the condition for maximum power output for an electric arc furnace. Also find power factor at maximum power loss. **8**

3. a) What are the requirements of good weld? State the advantages of using coated electrodes. **7**

b) Explain with the help of neat sketch the principle of projection welding. Give its advantages over spot welding. **6**

**OR**

4. a) Describe briefly various types of arc welding process used in industry. **7**

b) Discuss in detail the principle of operation of electron beam welding. **6**

5. a) Define and explain following terms: **6**

- i) Solid angle
- ii) Utilization factor
- iii) Luminance

b) The hall of 30 x 20 sq. m. area is to be provided with an average illumination of 200 lux. The lamps are to be fitted 4m from ground floor. Find the number of lamps & wattage / lamp for the lighting scheme. Efficiency of the lamps available is 25 lumen's / watt, depreciation factor is 0.8 and co-efficient of utilization is 0.75. Give satisfactory spacing arrangement. **8**

**OR**

6. a) Discuss various factors to be considered while designing lighting scheme. 7
- b) A 500 W lamp having MSCP of 800 is suspended 3 m above the working plane. Calculate: 7
- i) Illumination direct below the lamp.
- ii) Lamp efficiency.
- iii) Illumination at a point 2.4m away on horizontal plane from vertically below the lamp.

7. a) Explain in detail the function of the refrigerator. Also draw and explain its electrical circuit. 7
- b) Draw and explain vapor absorption system. Give its advantages over vapor compression system. 6

**OR**

8. a) Define air-conditioning - Explain the factors on which air conditioning depends. 7
- b) Describe complete arrangement of centrally air conditioning plant. 6
9. a) Explain different types of fans with respect to their characteristics and applications. 7
- b) How do you assess the performance of fans? Explain. 6

**OR**

10. a) What are pump curves. Explain system characteristics of pumps. 7
- b) List the energy saving opportunities in a pumping system. 6
11. a) What are the types of compressors? Explain Reciprocating compressors in detail. 7
- b) Explain briefly the components of compressed air system. 6

**OR**

12. a) State the factors considered while selecting the site for diesel generating systems. 6
- b) What are the various operational factors in D.G. set? 7

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