BHARATI VIDYAPEETH INSTITUTE OF TECHNOLOGY

Question Bank (K-Scheme)

Name of subject: Utilization of Electrical Energy   **Unit Test: I**

Subject code: 314323   **Course: EE4K**
Semester: IV

UNIT-I

Illumination (CO1)

(2 Marks)

1. Define the following terms with reference to illumination
   i) MSCP ii) Coefficient of Utilization .

2. Define Illumination .State its Unit.

3. State Lambert's cosine law of illumination.

4. Define the following related to illumination i) Luminous intensity ii) Waste light factor.
5. State various types of lighting schemes.
6. Define the following terms with reference to illumination
   i) LUX   ii) Maintenance Factor
7. State the various types of reflectors used in industrial lighting fittings.

(4 Marks)

1. Draw and explain working of the fluorescent Tube.
2. State the various types of lighting schemes used in illumination and explain any two of them.
3. State and Explain inverse square Law.
4. Explain working of LED with neat diagram.

5. State and Explain the factors affecting quality of lighting system

6. Explain with neat diagram metal halide lamp.

7. Estimate the number and wattage of lamps which would be required to illuminate a workshop 80 m by 20 m, spaced 60×15 m by means of lamps mounted 6 m above the working plane. The average illumination required is about 100 lux, coefficient of utilisation is 0.4, luminous efficiency is 16 lumens per watt. Assume a space height ratio of unity and a candle power depreciation of 20%.

UNIT - II
Electric Heating (CO2)

(2 Marks)

1. State the modes of heat transfer.
2. Write the classification of Electric Heating
3. Draw a neat labelled diagram of direct arc furnace.
4. State principle of Dielectric Heating.
5. State applications of Dielectric Heating.

(4 Marks)

1. Explain with a neat labelled schematic diagram the working of the Ajax Wyatt furnace.
2. Explain with neat labelled diagram construction and working of indirect arc furnace .
3. Draw and explain the principle of dielectric heating. State its 4 applications
4. Compare core type of furnace and coreless type of furnace (Induction) on following points.
   i) Weight and size ii) Frequency iii) Leakage flux iv) Crucible shape
5. Describe any two methods of temperature control of resistance furnace.
6. Explain with neat labelled diagram construction and working of direct resistance heating.

7. A 40 kW, 3-phase, 400 V resistance oven uses nickel-chromium strip of 0.3 mm thickness. The heating elements are star connected. The wire temperature is to be 1127°C and that of charge is to be 727°C, estimate the width and length of the wire required.
   Given: radiation efficiency = 0.6, specific resistance of Ni-Cr = 1.03×10–6 ohm-m, emissivity = 0.9.
8. A resistance oven employing Nichrome wire is to be heated from 220 V, 1φ a.c. supply and is rated at 16 kw. If the temperature of the heating element is to be heated to 1170°C and average temperature of the charge is 500°C. Find the diameter and length of the wire. Given radiating efficiency k = 0.6, emissivity = 0.9, Specific resistance = 1.09 × 10–6 ohm-m.
9. Explain direct arc furnace method with diagram.

UNIT - III

Electric Welding (CO3)

(2Marks)

1. List any two applications of each i) spot welding ii) seam welding .
2. Write the classification of resistance welding.

(4 Marks)

1. List different types of welding. Explain any one.
2. Describe with neat sketch; the working principle of spot welding and state its application.
3. Compare resistance welding and arc welding on the basis of –
   (i) Supply requirement (ii) Voltage (iii) Power factor (iv) Additional material requirement (v) External pressure (vi) Temperature

4. Explain with neat sketch Seam welding and state two application

5. Write classifications of electrical welding system.