

BHARATI VIDYAPEETH INSTITUTE OF TECHNOLOGY

Question Bank (I-Scheme)

Name of subject: Utilization of Electrical
Energy

Unit Test: 1

Subject code: 22626
Semester: VI

Course: EE6I

UNIT-I

Illumination (CO1)

(2 Marks)

1. Define the following terms with reference to illumination
i) MSCP ii) Coefficient of Utilization
2. State Lambert's cosine law of illumination.
3. Define the following related to illumination i) Luminous intensity ii) Waste light factor.
4. List any two application of i) LED lamp ii) Metal halide lamps.
5. Define the following terms with reference to illumination
i) LUX ii) Maintenance Factor
6. Define the following terms –
(i) Solid angle (ii) Waste light factor
7. State the various types of reflectors used in industrial lighting fittings.
8. List any two advantages of electronic ballast.
9. State the various types of lighting Schemes

(4 Marks)

1. Draw a neat labelled diagram of the conventional fluorescent tubelight. State the function of choke and starter in it.

2. Describe the main features and areas of applications for i) Semi-direct and ii) Indirect lighting schemes.
3. State and Explain Law of inverse square.
4. State and Explain Lambert's Law.
5. A small assembly shop of 16 m long, 10 m wide and 3 m upto trusses is to be illuminated to a level of 200 Lux. The utilization and maintenance factors are 0.74 and 0.8 respectively. Calculate the no. of lamps required to illuminate the whole area if the lumen output of lamp selected is 3000 lumens.
6. Write a Note on Electronic Ballast.
7. Explain working of Mercury vapour Lamp and state its application.
8. Describe with neat labelled diagram, working of High Pressure Mercury Vapour lamp.
9. Compare fluorescent lamp and LED lamp on the basis of Quality of light; lamp efficiency; Life of lamp and voltage regulation.

UNIT - II

Electric Heating and Welding systems (CO2)

(2 Marks)

1. State the classification of electric welding.
2. Draw a neat labeled diagram of direct arc furnace.
3. List any two applications of each i) spot welding ii) seam welding
4. Write the classification of resistance welding.
5. List any six applications of dielectric heating

(4Marks)

1. Draw V-I characteristics of an electric arc. Describe how arc length affects the arc stability.
2. Explain with a neat labelled schematic diagram the working of the Ajax

Wyatt furnace

3. List any four equipment's used in arc furnace with their application.
4. 'Only DC Supply is used for Carbon arc welding'. Justify.
5. Explain with neat sketch the working principle of Dielectric heating. Give any four applications
6. Describe any two methods of temperature control of resistance furnace.
7. Compare A.C. welding with D.C. welding on the basis of:
1) Equipment, 2) Operating efficiency, 3) Cost, 4) No-load voltage 5) Heating 6) Arc Stability
8. 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.
9. 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
10. Explain with neat sketch working of coreless induction furnace.
11. A resistance oven employing Nichrome wire is to be heated from 220V single phase a.c supply & 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 wire.
Given radiating efficiency k is 0.6; Emissivity is 0.9 and specific resistance is 1.09×10^{-6} ohm-m.

UNIT - III

Electric Drives and Elevators (CO3)

(2 Marks)

1. Define group drive and individual drive.

2. State any four advantages of individual drive.
3. Suggest a suitable electric drive for each of the following application :
 1. Paper mills
 2. Electric traction.
4. State the function of bearing. State any two advantages of ball or roller bearing.
5. Give the types of elevator based on: i) Speed and ii) Capacity.
6. Write any two conditions for regenerative braking.

(4 Marks)

1. State the need of load equalization in motors. Describe the method to achieve it.
2. Describe Rheostatic braking applied to 3-phase induction motor
3. Draw and explain the load cycle for the following type of load:
 - i) Intermittent loading
 - ii) Continuous operation with short time loading.
4. Explain the factors on which shape and size of the elevator car depends.
5. List any four safety and protective devices used in elevator.