

# **Government Polytechnic, Rajkot**

## **Electrical Engineering Department**

### **Diploma in Electrical Engineering, Semester-4**

Subject Name: **Utilization of Electrical Energy**

Subject Code: **3340903**

## **Question Bank**

### **Unit – 1 Illumination**

#### **Laws of Illumination & Definitions**

1. Define
  - a. Illumination
  - b. Absorption factor
  - c. Luminous flux
  - d. Lamp Efficiency
  - e. Waste Light factor
  - f. Luminous Intensity
  - g. MHCP
  - h. MSCP
2. Explain Solid angle.
3. Explain Depreciation factor and Utilization factor.
4. Explain Cosine law of illumination.
5. Explain inverse square law of illumination.
6. Establish relation between plane angle and solid angle.
7. Explain space height ratio.

#### **Various Lamps**

1. Explain carbon filament lamp.
2. Explain construction and working of fluorescent tube light.
3. Explain Halogen Lamp.
4. State the application of halogen lamp.
5. Explain construction and working principle of sodium vapor lamp.
6. Explain construction and working of metal halide lamp.
7. Explain construction and working of neon lamp.
8. State application of neon lamp.
9. Give the advantages of Electronic Ballast.
10. Explain the construction of electronic ballast with the help of diagram.
11. Compare CFL lamp with other lamp.

# **Government Polytechnic, Rajkot**

## **Electrical Engineering Department**

### **Diploma in Electrical Engineering, Semester-4**

Subject Name: **Utilization of Electrical Energy**

Subject Code: **3340903**

## **Question Bank**

### **Unit – 2 Electrical Heating & Welding**

#### **Electrical Heating**

1. Explain the modes of heat transfer.
2. Give four advantages of electric heating.
3. Give classification of electric heating.
4. State properties of good heating element material.
5. Explain principle of resistance heating in short.
6. Explain various methods of heat control in resistance furnace in short.
7. State the different types of arc furnace. Explain any one of them.
8. State the principle of Induction heating.
9. Explain construction and working of vertical type core furnace.
10. Describe the working methodology of resistance oven.
11. State working Principle of Dielectric Heating and write down it's applications.
12. State the causes of failure of heating element.

#### **Electrical Welding**

1. State the advantages of electric welding.
2. Compare AC & DC welding.
3. State working Principle of Resistance welding and write down it's applications.
4. Explain the significance of good welds

#### **Numericals**

1. Four windings each having resistance of  $30\ \Omega$  is used in resistance oven. Supply voltage is 240 V AC. Calculate its power consumption if
  - a. All windings are connected in series
  - b. Connected in parallel

# **Government Polytechnic, Rajkot**

## **Electrical Engineering Department**

### **Diploma in Electrical Engineering, Semester-4**

Subject Name: **Utilization of Electrical Energy**

Subject Code: **3340903**

## **Question Bank**

### **Unit – 3 Electric Drives & Elevators**

#### **Electric Drives**

1. Define:
  - a. Electric Drive
  - b. Active Load Torque
  - c. Passive Load Torque
  - d. Group drive
  - e. Individual Drive
  - f. Multi-motor Drive
2. Give four advantages of electric drive.
3. Draw and Explain block diagram of Electric Drive.
4. Explain the functions of power modulator.
5. State factors governing selection of electrical motor for electric drive.
6. Give advantages and disadvantages of DC drive.
7. Give comparison between A.C. drive and D.C. drive.
8. Compare group drive and individual drive.
9. Give advantages and disadvantages of individual drive.
10. Draw the speed-torque characteristics of DC series motor.
11. Draw and explain torque-slip characteristics of three phase induction motor.

#### **Elevators**

12. State the different types of elevators.
13. Explain geared traction elevator.
14. Explain hole type hydraulic elevator.
15. Explain hole less hydraulic elevator.
16. Compare the hydraulic elevator and traction elevator.
17. State the various control used in modern elevators.
18. Write down important points to be considered for the safety in elevators.

# Government Polytechnic, Rajkot

## Electrical Engineering Department

### Diploma in Electrical Engineering, Semester-4

Subject Name: **Utilization of Electrical Energy**

Subject Code: **3340903**

## Question Bank

### Unit - 4 Electric Traction

1. Define:
  - a. Maximum speed
  - b. Average Speed
  - c. Scheduled Speed
2. Give requirements of ideal traction system.
3. State advantages of electrical traction system.
4. State disadvantages of DC Traction system.
5. State different types of electrical traction system and explain any two.
6. Write different types of electric locomotive.
7. State four disadvantages of diesel electric traction system.
8. What is the load fluctuation? Explain its effects.
9. Explain Kando system of track electrification.
10. Explain 25 kV, 50 Hz, 1- $\Phi$  wire earth return type AC to DC composite
11. system used in traction.
12. Define schedule speed Also list out the factors affecting the schedule speed.
13. Draw typical speed time curve and explain its four components.
14. Draw the speed time curve for following train services and compare them.
  - a. Main line services
  - b. Suburban service
  - c. Urban service
15. Explain suburban type train service.
16. Derive an equation of maximum speed for trapezoidal speed time curve.
17. Explain battery electric drive. Give its advantages and disadvantages.

# **Government Polytechnic, Rajkot**

**Electrical Engineering Department**

**Diploma in Electrical Engineering, Semester-4**

Subject Name: **Utilization of Electrical Energy**

Subject Code: **3340903**

## **Question Bank**

### **Unit – 5 Domestic Electrical Appliances**

1. Explain working principle of microwave oven with block diagram.
2. Write main parts of Washing Machine.
3. Explain construction and working principle of storage water heater.
4. Write down possible electric faults, its causes and remedies for electric ceiling fan.
5. Explain with electric diagram the working of vacuum cleaner.
6. State Possible Troubles and Causes in Electric Iron.
7. Explain Construction and Working of Mixer- Grinder.
8. Explain trouble shooting of domestic flour mill.
9. Explain Toaster.
10. Explain concept of star system for energy conservation.
11. State measures adopted for energy conservation in different domestic equipments.