## Manmohan Technical University Office of the Controller of Examinations

Budhiganga-4, Morang, Koshi Province, Nepal

### **MODEL QUESTION**

School of EngineeringLevel: BachelorProgram:Year/Part: III/IISubject: Illumination Design and Industrial Electrification (EG 662 EE)Full Marks: 50Pass Marks: 25Time: 3 Hours

#### Instructions to Examinees:

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

#### **GROUP A (Multiple-Choice Questions)**

[ 10×1= 10]

**Time: 20 Minutes** 

Q.N.	MCQ Questions
1.	Which type of cable is commonly used in industrial buildings for wiring due
	to its durability and insulation?
	a. Armored cable
	b. Coaxial cable
	c. Fiber optic cable
	d. Twisted pair cable
2.	What is the primary purpose of electrical safety codes and standards in wiring
	installations?
	a. To reduce installation costs
	b. To ensure safe and reliable operation
	c. To minimize the length of wires
	d. To enhance aesthetics
3.	A resistance heating system has a resistance of 15 ohms and operates at
	230V. What is the power consumed by the system?
	a. 3.5 kW
	b. 3.53 kW
	c. 4.5 kW
	d. 2.3 kW
4.	What is the primary advantage of using dielectric heating in industrial
	applications?
	a. Uniform heating of non-conductive materials
	b. Reduced power consumption
	c. High-temperature generation
	d. Resistance to wear and tear
5.	The total luminous flux required for a workspace is 12,000 lumens. If the
	luminous efficacy of the lamps used is 80 lumens per watt, what is the total
	power consumed by the lamps?
	a. 100 W

- b. 150 W
- c. 160 W
- d. 200 W

6. What is the primary advantage of using LED lighting in industrial illumination systems?

- a. Higher color temperature
- b. Lower production cost
- c. Energy efficiency and longer lifespan
- d. Increased requirement for heat dissipation

7. A motor with a power rating of 10 kW is to be connected to a three-phase supply. If the power factor is 0.9 and the line voltage is 400V, what is the current drawn by the motor?

- a. 16.04 A
- b. 18.04 A
- c. 20.04 A
- d. 22.04 A
- 8. Load calculation in industrial buildings is necessary for determining which of the following?
  - a. Size of conductors and rating of equipment
  - b. Power factor of the circuit
  - c. Type of luminaries to be used
  - d. Number of outlets needed
- 9. Which type of electrical drive is best suited for applications requiring precise control over speed and torque?
  - a. Group drive
  - b. Individual drive
  - c. Multi-motor drive
  - d. Belt-driven drive
- 10. . Which method is commonly used to transfer power in industrial electrical drives?
  - a. Resistance coupling
  - b. Inductive coupling
  - c. Direct coupling using gears or belts
  - d. Capacitance coupling

# **GROUP B (Short Answer Questions - Attempt Any Eight Questions)**

Q.N.	Questions	Marks
1.	Define Correlated Color Temperature (CCT). Explain its effect on lighting quality.	2
2.	What is floodlighting? Describe its principle.	2
3.	State and explain the inverse square law of illumination. Provide a simple mathematical expression and a practical example to illustrate its importance.	2
4.	What is a Molded Case Circuit Breaker (MCCB)? Describe its function.	2
5.	List and explain the three main methods of thermal energy storage. Mention one application for each method.	2
6.	Why should the secondary of a Current Transformer (CT) never be left open-circuited during operation? Explain with reasoning and possible consequences.	2
7.	How do you identify the actual size of a motor when there are various loads at different time intervals? Give a real-world example of any one method.	2
8.	What is an energy audit? Explain benefits of conducting an energy audit in industries.	2
9.	Define Uninterruptible Power Supply (UPS). Explain its basic working principle.	2

### **GROUP C (Long Answer Questions - Attempt Any Six Questions)**

Q.N.	Questions	Marks
10.	How do you estimate the electrical load for a residential building? Explain the necessity	4
	of load approximation and its significance.	
11.	Describe the properties of good heating element materials. Also discuss common types	4
	of heating elements and the causes behind their failure in electrical appliances.	
12.	A department store 30m X 15m is illuminated by twin 40W fluorescent luminaries of	4
	output 4800 lumens. The lamp being mounted at height of 3m from the work place. The	
	average illumination required is 200 lux. Calculate the number of luminaries required to	
	be fitted in the department store, assuming the coefficient of utilization to be 0.8, and	
	maintenance factor to be 0.8.	
13.	Explain the various types of MCBs with their function and application.	4
14.	with a neat sketch, explain the block diagram of electric drive system.	4
15.	Highlighting the importance of energy audit, explain the methodology to be carried out	4
	energy audit in an industry.	
16.	With a neat schematic diagram, explain the working of on-line UPS.	4
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