Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2024

Subject Code:3170920 Date:01-06-2024

Subject Name:Industrial Electrical Systems

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	How many types of tariff structures is used for residential connection.	**03**
	(b)	Explain the protective devices and its importances in residential wiring system.	**04**
	(c)	Discuss the general rules of residential wiring.	**07**
Q.2	**(a)**	What is a role of single line diagram (SLD) in electrical circuits?	**03**
	(b)	Make list of electrical safety practices.	**04**
	(c)	Discuss the method of load calculation and sizing of the wire.	**07**
		OR	
	(c)	Discuss the electrical earthing system for residential building	**07**
Q.3	**(a)**	Define the following term: (i) Luminous flux (ii) Luminous intensity (iii) specific consumption	**03**
	(b)	Calculate the brightness (or luminance) of snow under an illumination of (a) 44,000 lux and (b) 0.22 lux. Assume that snow behaves like a perfect diffuser having a reflection factor of 85 per cent.	**04**
	(c)	Discuss the operation of LED lamp as energy efficient lamp.	**07**
		OR	
Q.3	**(a)**	Define the following terms (i) Mean horizontal candle power (M.H.C.P),(ii) Mean Spherical candle power (M.S.C.P.) and (iii) Mean hemi-sphrical candle power (M.H.S.C.P)	**03**
	(b)	Design the adequate lighting scheme for the reading hall.	**04**
	(c)	A lamp giving out 1200 lumen in all directions is suspended 8 m above the working plane calculate the illumination at a point on the working plane 6 m away from the foot of lamp.	**07**
Q.4	**(a)**	What are the effects of poor power factor on distribution system?	**03**
	(b)	Compare the MCB and ELCB.	**04**
	(c)	Discuss the essential protective components of industrial substations.	**07**
		OR	
Q.4	**(a)**	What are the types of UPS and its application?	**03**
	(b)	Discuss the factor of transformer selections.	**04**
	(c)	Explain the important of power factor improvement and its methods.	**07**
Q.5	**(a)**	Draw the block diagram of PLC.	**03**
	(b)	Explain the electrical system for the elevator.	**04**
	(c)	Write short note on SCADA system for distribution automations.	**07**

OR

Q.5	**(a)**	Write down the advantages of process automations.	**03**
	(b)	Discuss the PLC based speed control system of electrical motor.	**04**
	(c)	A synchronous motor improves the power factor of a 300kW load from 0.7 lagging to unity power factor and simultaneously the motor carries a load of 100 kW. Calculate the power factor at which the motor operates.	**07**

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