Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2022

Subject Code:3170920 Date:12-01-2023

Subject Name:Industrial Electrical Systems

Time:10:30 AM TO 01:00 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)**	List out any three general rules for residential installation.	**03**
	(b)	Explain requirement of commercial installation.	**04**
	(c)	Illustrate single line diagram (SLD) of wiring system.	**07**
Q.2	**(a)**	State the need of Contactor, Isolator, and protective Relays.	**03**
	(b)	Classify electric elevators.	**04**
	(c)	Sketch architecture of SCADA system with neat diagram.	**07**
		OR	
	(c)	Sketch a block diagram of PLC with basic components and its Functions.	**07**
Q.3	**(a)**	Define following terms referred to illumination: (a) Space-height ratio (b) Glare (c) Candle power	**03**
	(b)	A room with an area of 6 × 9 m is illustrated by ten 40-W lamps. The luminous efficiency of the lamp is 100 lumens/W and the coefficient of utilization is 0.65. Find the average illumination.	**04**
	(c)	Describe through illustrations the Different types of lighting scheme.	**07**
		OR	
Q.3	**(a)**	Define following terms referred to illumination: (a) lumen (b)Waste light factor (c) lamp efficiency	**03**
	(b)	The flux emitted by 100-W lamp is 1,400 lumens placed in a frosted globe of 40 cm diameter and gives uniform brightness of 250 milli-lumens/m^2 in all directions. Calculate the candle power of the globe and the percentage of light absorbed by the globe.	**04**
	(c)	Explain Construction and working of compact fluorescent light (CFL).	**07**
Q.4	**(a)**	Define:1)MCB 2)ELCB 3)MPCB	**03**
	(b)	Distinguish between LT and HT Motor? Analyze with an example.	**04**
	(c)	The monthly readings of a consumer's meter are as follows: Maximum demand = 50 kW, Energy consumed = 36,000 kWh Reactive energy = 23,400 kVAR. If the tariff is Rs 80 per kW of maximum demand plus 8 paise per unit plus 0·5 paise per unit for each 1% of power factor below 86%, calculate the monthly bill of the consumer.	**07**
		OR	
Q.4	**(a)**	List out steps to be followed for safety precautions against an electric shock.	**03**
	(b)	Analyze earthing of commercial installation.	**04**
	(c)	A supply system feeds the following load.(i)a lighting load of 500 kW (ii)a load of 400 kW at 0.707 p.f. lagging (iii) a load of 800 kW at 0.8 p.f. leading.(iv) a load of 500 kW at 0.6 p.f. lagging v)a synchronous motor driving a 540 kW d.c. generator and having overall efficiency of	**07**

90%.Evaluate the power factor of synchronous motor so that station Power factor may become unity.

Q.5	**(a)**	List out steps for selections of transformer.	**03**
	(b)	Describe selection procedure of ELCB for industrial dwelling.	**04**
	(c)	Distinguish between continuous power, prime power and standby power related with standby generator.	**07**

OR

Q.5	**(a)**	List out different types of UPS.	**03**
	(b)	Illustrate a single line diagram of outdoor substation showing all accessories of the system.	**04**
	(c)	Analyze the needs of DG system with advantages & disadvantages.	**07**

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