Reg. No.															

Question Paper Code	12786

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Sixth Semester

Electrical and Electronics Engineering

20EEEL603 - ELECTRIC ENERGY UTILIZATION AND CONSERVATION

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Define luminous efficiency.	2	K1	CO1
2.	What are the different types of electrical lamps used for illumination?	2	K1	CO1
3.	Compare Direct saving and pay back analysis.	2	K2	CO2
4.	Illustrate the factors affecting motor efficiency.	2	K2	CO2
5.	What is meant by arc welding?	2	K1	CO3
6.	Classify the methods of electric heating.	2	K2	CO3
7.	What motor is used for electric traction? and Why?	2	K2	CO4
8.	What are the factors affecting schedule speed in electric traction?	2	K1	CO4
9.	Outline the purpose of earthing.	2	K2	CO5
10.	Infer the power quality problems due to domestic loads.	2	K2	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	A hall 30m long and 12m wide is to be illuminated and the illumination required is 50 lumens/m^2. Deduce the number of fitting required, taking depreciation factor of 1.3 and utilization factor of 0.5. Given that the outputs of different types of lamp are given below: Watts : 100 200 300 500 1000 Lumens : 1625 3650 4720 9970 21520	13	K2	CO1
		OR			
	b)	Explain Incandescent lamp and Sodium Vapor lamp with neat diagrams.	13	K2	CO1
12.	a)	Illustrate the different types of water cooler with neat diagram.	13	K2	CO2
		OR			
	b)	Outline the working principle of Air-conditioning system and briefly explain classification of Air-conditioning systems.	13	K2	CO2

13.	a) i)	Illustrate the types of heating and Explain about the induction heating.	*6*	*K2*	*CO3*
	ii)	Classify the types of electric welding and Explain the Butt welding with neat diagram.	*7*	*K2*	*CO3*
		OR			
	b) i)	Explain the types of ARC furnace and describe the operation.	*6*	*K2*	*CO3*
	ii)	Describe the construction and working principle of dielectric heating.	*7*	*K2*	*CO3*
14.	a)	Outline the speed – Time curve of a traction system. Also explain various periods and the action.	*13*	*K2*	*CO4*
		OR			
	b)	A 250 tones train with 10% rotational inertia effect is started with uniform acceleration and reaches a speed of 50 kmphps in 25 seconds on level road. Calculate the specific energy consumption if the journey is to be made according to trapezoidal speed- time curve. Acceleration = 2 kmphps; Tracking retardation = 3 kmphps; Distance between the stations = 2.4 km; efficiency = 0.9; Track resistance = 5 kg/tones.	*13*	*K2*	*CO4*
15.	a)	Explain briefly with neat diagram working of Online and Offline uninterrupted power supply.	*13*	*K2*	*CO5*
		OR			
	b)	Compare briefly different types of house of wiring systems.	*13*	*K2*	*CO5*

PART - C (1 × 15 = 15 Marks)

16.	a) i)	Classify the various types of electric braking used in traction and Discuss any two types in detail.	*8*	*K2*	*CO4*
	ii)	Explain with neat diagram different types of domestic earthing.	*7*	*K2*	*CO5*
		OR			
	b) i)	Illustrate the recent trends in electric traction systems.	*8*	*K2*	*CO4*
	ii)	Explain suitable methods to mitigate power quality issues in distribution system.	*7*	*K2*	*CO5*