Reg. No.															

Question Paper Code	13507

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Sixth Semester

Electrical and Electronics Engineering

20EEEL603 - ELECTRIC ENERGY UTILIZATION AND CONSERVATION

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	An incandescent lamp can be used (a) in any position (b) on both ac and dc supply (c) for street lighting (d) all of the above	1	K1	CO1
2.	Which of the following instruments is used for the comparison of candle powers of different sources? (a) Radiometer (b) Bunsen meter (c) Photometer (d) Candle meter	1	K1	CO1
3.	Which refrigerant is commonly used in domestic refrigerators? (a) R-12 (b) R-22 (c) R-134a (d) Ammonia	1	K1	CO2
4.	Which factor contributes most to the savings from an energy-efficient motor? (a) Lower maintenance cost (b) Reduced power consumption (c) Faster speed (d) Higher voltage requirement	1	K1	CO2
5.	Which type of electric heating is used in microwave ovens? (a) Resistance heating (b) Induction heating (c) Dielectric heating (d) Arc heating	1	K1	CO3
6.	Anodizing increases the_____ (a) Conductivity (b) Corrosion resistance (c) Magnetic permeability (d) Thermal conductivity	1	K1	CO3
7.	The primary purpose of a traction motor is to: (a) Generate electricity (b) Provide mechanical power for movement (c) Regulate voltage (d) Control lighting	1	K1	CO4
8.	A third rail system is primarily used in: (a) Long-distance trains (b) Urban metro systems (c) High-speed trains (d) Freight trains	1	K1	CO4
9.	What is the objective of energy conservation measures? (a) To increase investment (b) To decrease fuel costs (c) To increase fuel cost (d) To decrease output per unit	1	K1	CO5
10.	Which device is commonly used for energy regulation in power electronics? (a) Capacitor (b) Inductor (c) Thyristor (d) Resistor	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Recall illumination laws.	2	K1	CO1
12.	List out the various factors for designing the lightning scheme.	2	K1	CO1
13.	Define Stephan's law of radiation.	2	K1	CO1
14.	What are the elements of refrigeration system?	2	K1	CO2
15.	What are the factors affecting comfort in air conditioning system?	2	K1	CO2
16.	List the factors affecting motor efficiency.	2	K1	CO2
17.	Recall the properties of a heating element used in indirect resistance heating.	2	K1	CO3
18.	Classify the modern welding techniques.	2	K2	CO3
19.	Relate the requirements of an ideal traction system with practical system.	2	K1	CO4

20.	List out the factors affecting specific energy consumption of an electric train operation on a given schedules.		*2*	*K1*	*CO4*
21.	Which types of batteries normally used for UPS?		*2*	*K1*	*CO5*
22.	Why do non-linear loads cause harmonics?		*2*	*K1*	*CO5*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Summarize about factory lighting and street lighting.	*11*	*K2*	*CO1*
		OR			
	b)	Illustrate about photometry and different types of photocell used for photometry measurement.	*11*	*K2*	*CO1*
24.	a)	Explain different types of water cooler with neat diagram.	*11*	*K2*	*CO2*
		OR			
	b)	Illustrate the classification of Air-conditioning systems with its working principle.	*11*	*K2*	*CO2*
25.	a)	Examine the induction heating along with Ajax-wyatt furnace.	*11*	*K2*	*CO3*
		OR			
	b)	Explain about the process of fusion and non-fusion welding.	*11*	*K2*	*CO3*
26.	a)	Construct the series- parallel control of electric traction motor. Also specify the advantages .	*11*	*K3*	*CO4*
		OR			
	b)	Identify different types of braking system and explain any two types in detail.	*11*	*K3*	*CO4*
27.	a)	Explain Energy conservation techniques with one case study in generation, transmission and distribution systems.	*11*	*K2*	*CO5*
		OR			
	b)	Relate briefly different power quality problems due to home appliances.	*11*	*K2*	*CO5*
28.	a) (i)	Outline coefficient of adhesion and how does it affect slipping of driving wheels of the traction unit.	*6*	*K2*	*CO4*
	(ii)	Summarize with neat diagram different types of the house wiring.	*5*	*K2*	*CO5*
		OR			
	b)(i)	A trolly wire of a tramway is suspended from two poles 40m apart, If the tension applied is 500kg. Show the total length of wire required.	*6*	*K2*	*CO4*
	(ii)	Outline in detail different types of substation earthing.	*5*	*K2*	*CO5*