Roll No. | | | | | | | | | | |

B.E END SEMESTER EXAMINATION
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
COLLEGE OF ENGINEERING, ANNA UNIVERSITY CHENNAI – 25
EE5030 UTILIZATION AND CONSERVATION OF ELECTRICAL ENERGY – MAY 2024

Time:3 hrs | Max.Marks: 100

CO1	Ability to choose suitable electric drives for different applications.
CO2	Ability to design the illumination systems for energy saving.
CO3	Ability to understand the utilization of electrical energy for heating and welding purpose.
CO4	Ability to know the effective usage of solar energy for electrical applications
CO5	Ability to locate the wind farm for generating electrical energy.

BL – Bloom's Taxonomy Levels
(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A (10x2=20Marks)
(Answer all Questions)

Q. No.	Questions	Marks	CO	BL
1	Define AU (unit of length).	2	2	L1
2	Define Electric Drive.	2	1	L1
3	List any two electrical features of Traction motor.	2	1	L2
4	What is Transmissivity? Give its expression.	2	2	L2
5	What is radiation processing?	2	3	L2
6	Give the main feature of welding type - EGW	2	3	L2
7	Define luminous intensity	2	2	L1
8	Define Candle power	2	2	L1
9	Define Power Coefficient	2	5	L1
10	Give a short note on Wind speed Vs Height	2	5	L3

PART- B (5x 13=65Marks)

Q. No.	Questions	Marks	CO	BL
11 (a)	i. Write about any four physical properties and processes involved in the conversion of solar radiation into heat.	7	4	L3
	ii. What are the different types collectors.	6	4	L3
	OR			
11 (b)	i. Calculate the solar constant using Stefan - Boltzmann constant.	6	4	L4
	ii. Explain the working of a Cylindrical parabolic concentrator with a neat diagram.	7	4	L3
12 (a)	i. Discuss Electric Breaking in detail.	6	3	L3
	ii. Write short notes on Power Transformer and its applications.	7	1	L3
	OR			
12 (b)	i. Write short notes on regenerative braking	6	1	L3
	ii. Explain the choice of Electric Motor For Railway application	7	1	L3
13 (a)	i. What are various factor for the selection of Power supply for welding Process	7	3	L2
	ii. Give the principle of operation, application and advantages of Arc furnaces	6	3	L1
	OR			
13 (b)	i. What are the three main modes of Heat Transfer? Give a real	9	3	L2

	time example for each mode.			
	ii. Write short notes on the two welding types: PAW, ESW	4	3	L1
14 (a)	i. Explain with the neat figure the construction and working of Sodium vapour lamp	7	2	L3
	ii. An office 25m x 12m is illuminated by 40 W incandescent lamps of lumen output 2700 lumens, The average illumination required at the work place is 200 lux. Calculate the number of lamps required to be filled in the office. Assume utilization and depreciation factors as 0.65 and 1.25 respectively.	6	2	L5
	OR			
14 (b)	i. Explain with the neat figure the construction and working of a Fluorescent lamp.	7	2	L3
	ii. An illumination of 25 lux is to be produced on the floor of a room 12m x 9m. 18 lamps are required to produce this illumination in the room, if 50% of the emitted light falls on the floor. What is the power of the lamp in candela?	6	2	L5
15 (a)	i. Explain the basic component of Wind Energy Conversion System.	6	5	L4
	ii. With a neat schematic structure explain about Horizontal axis wind turbine.	7	5	L4
	OR			
15 (b)	i. Give the classification of Wind Energy Conversion System.	6	5	L4
	ii. With a neat schematic structure explain the Vertical axis wind turbine.	7	5	L4

PART- C (1x 15=15Marks)

(Q.No.16 is compulsory)

Q. No.	Questions	Marks	CO	BL
16.	Design a lighting scheme for your classroom and sports ground based on the recommended levels of illumination and considering all the five important factors for designing a lighting scheme.	15	2	L6