O.P.Code: 19EE0222	R19	H.T.No.									

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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations June-2024
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	State and explain laws of illumination.	CO1	L2	6M
	b	If a lamp of 200 cp is placed 1m below a plane mirror which reflects 90% of light falling on it, determine illumination at a point 3m away from the foot of the lamp which is hung 4m above ground.	CO1	L3	6M

OR

2	a	Write short notes on polar curves and explain the Rousseau's construction for calculating MSCP of lamp.	CO1	L2	6M
	b	A room measuring 30m×15m is to be illuminated by 10 lamps and the average illumination is to be 85 lux. Determine the MSCP of each lamp if the utilization and depreciation factors are 0.5 and 0.8 respectively.	CO1	L3	6M

UNIT-II

3	a	Describe direct and indirect core type furnace with neat sketches.	CO2	L2	6M
	b	A slab of insulating material 150 sq cm in area and 1 cm thick is to be heated by dielectric heating. The power required is 400 W at 30 × 106 cps. Materials has permittivity of 5 and power factor of 0.05. Determine voltage necessary	CO2	L3	6M

OR

4	a	Explain briefly the types of electric arc welding.	CO2	L3	6M
	b	Discuss faraday's laws and applications of electrolysis in detail	CO2	L2	6M

UNIT-III

5	a	What is the Classification of Electrical Drives?	CO3	L2	6M
	b	What is load equalization?	CO3	L2	6M

OR

6	a	How do you select a motor for an industrial application?	CO3	L3	6M
	b	What are the advantages of group drive?	CO3	L2	6M

UNIT-IV

7	Discuss the characteristic features of a traction motor for effective traction systems.	CO4	L3	12M

OR

8	**a** Discuss the speed-time curves for urban service.	CO4	L3	6M
	b A train has schedule speed of 60 km/hr between the stops which are 6 km apart. Determine the crest speed over the run assuming trapezoidal speed time curve. The train accelerates at 2 km/hr/sec and retards at 3 km/hr/sec. Duration of stops is 60s.	CO4	L4	6M

UNIT-V

9	Explain the calculations of tractive effort required for train propulsion.	CO5	L3	12M

OR

10	An electric train of weight 250 ton has eight motors geared to driving wheels, each is 85 cm diameter. The tractive resistance is of 50/ton. The effect of rotational inertia is 8% of the train weight, the gear ratio is 4–1, and the gearing efficiency is 85% determine. The torque developed by each motor to accelerate the train to a speed of 50 kmph in 30 s up a gradient of 1 in 200.	CO5	L4	12M

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