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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2024

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
Semester V
EE5030 UTILIZATION AND CONSERVATION OF ELECTRICAL ENERGY
(Regulation2019)

Time:3hrs

Max. Marks: 100

CO1	To know various electric drives and traction motors with applications
CO2	To introduce the energy saving concept by different ways of illumination.
CO3	To understand the different methods of electric heating and electric welding.
CO4	To know how to utilize the solar radiation into electrical energy for different applications
CO5	To study basic principles of wind energy conversion

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	Differentiate group drive and individual drive.	2	CO1	L1
2	What are the requirements of ideal traction system?	2	CO1	L1
3	What is Roussean's construction and what is the purpose of it?	2	CO2	L1
4	A 250 V lamp has a total flux of 1500 lumens and takes a current of 0.4 A. Calculate (i) lumens per watt (ii) M.S.C.P per watt.	2	CO2	L2
5	Mention the advantages of using electrode coating.	2	CO3	L1
6	What are the advantages of laser welding?	2	CO3	L2
7	Define altitude angle and solar azimuth angle.	2	CO4	L1
8	What are the type of collectors used in solar power generation?	2	CO4	L2
9	What are the advantages of darrieus rotor?	2	CO5	L1
10	Define cut-in and cut-out speed of a wind turbine.	2	CO5	L2

PART- B(5x 13=65Marks)
(Restrict to a maximum of 2 subdivisions)

Q.No.	Questions	Marks	CO	BL
11 (a)	(i) Write a brief not tramways and trolley buses. (ii) Explain the electric braking in traction system.	6 7	CO1	L3
	OR			
11 (b)	Write a brief note on collector gear for overhead equipment.	13	CO1	L3
12 (a)	Explain the construction, working, stroboscopic effect, merits and demerits of fluorescent lamp	13	CO2	L3
	OR			
12 (b)	In detail describe the street lighting and factory lighting.	13	CO2	L3
13 (a)	In detail explain the working, advantages and applications of high frequency eddy-current heating.	13	CO3	L3
	OR			
13 (b)	Describe the working of spot welding and projection welding.	13	CO3	L3

14 (a)	Explain the principle of conversion of solar energy into heat.	13	CO4	L3
	OR			
14 (b)	Describe the performance analysis of a cylindrical parabolic concentrating collector.	13	CO4	L3
15 (a)	What are the factors to be considered for selection of site for wind turbine generating stations?	13	CO5	L3
	OR			
15 (b)	Describe the horizontal axis type wind turbine generators of WECS with suitable diagram.	13	CO5	L3

PART- C(1x 15=15Marks)
(Q.No.16 is compulsory)

Q.No.	Questions	Marks	CO	BL
16.	(i) A train runs between two stations 1.6 km apart at an average speed of 36 km/h. If the maximum speed is to be limited to 72 km/h, acceleration to 2.7 km/h/s, coasting retardation to 0.18 km/h/s and braking retardation to 3.2 km/h/s, compute the duration of acceleration, coasting and braking periods. Assume a simplified quadrilateral speed-time curve.	(9)	CO1	L5
	(ii) It is desired to illuminate a drawing hall with an average illumination of about 250 lux. the area of the hall is 30m × 20m. The lamps are to be fitted at 5m height. Find out the number and size of incandescent lamps required for an efficiency of 12 lumens/watt. Utilisation factor = 0.4 and maintenance factor = 0.85.	(6)	CO2	L6