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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 8007

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – MAY / JUNE 2024

Sixth Semester

Electrical and Electronics Engineering

U19EEV16 – UTILIZATION OF ELECTRICAL ENERGY

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Write any four advantages of electric heating.	2	K1	CO1
2.	Compare the salient features of AC welding and DC welding.	2	K4	CO1
3.	Define the terms i) Candle Power and ii) Space-height ratio	2	K1	CO2
4.	Why does the efficiency of the filament lamp increases with the increase in operating voltage?	2	K1	CO2
5.	Justify the need for earthing of electrical equipments.	2	K5	CO3
6.	Name few accessories used for domestic wiring.	2	K1	CO3
7.	Infer the advantages of electrical braking over mechanical braking.	2	K2	CO4
8.	Classify the types of electric traction system.	2	K1	CO4
9.	Write the factors to be considered for employing an air conditioning system.	2	K2	CO5
10.	List the desirable properties of refrigerants.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	State the principle of dielectric heating and derive the expression for consumption of power in dielectric heating process.	13	K4	CO1
	(OR)			
b)	Explain the following process with necessary diagrams. i. carbon arc welding and ii. metallic arc welding	13	K2	CO1
12. a)	i. Two lamp posts are 16 m apart and are fitted with a 100 CP lamp each at a height of 6 m above the ground. Calculate the illumination a. under each lamp. b. midway between the lamps.	6	K3	CO2
	ii. Explain the laws of illumination.	7	K2	
	(OR)			
b)	With diagram discuss the construction and principle of operation of Sodium Vapour lamp and LED lamp.	13	K2	CO2
13. a)	i. Illustrate the wiring diagram of fluorescent lamp and elaborate its working.	8	K2	CO3
	ii. Explain the working of staircase writing.	5	K2	
	(OR)			
b)	Explain the different earthing techniques adopted in industry and substations.	13	K2	CO3
14. a)	i. Deduce the expression for the tractive effort necessary to propel the train up and down the gradient.	9	K2	CO4
	ii. A locomotive exerts a tractive effort of 34 kN in hauling a train at 45 kmph on the level track. If the locomotive has haul the same train on a gradient and the effort required is 54 kN, determine the HP delivered by the locomotive when the motor are used are DC series motor.	4	K3	
	(OR)			
b)	i. Discuss the suitability of DC series motor for traction applications.	7	K2	CO4
	ii. Illustrate the speed time characteristics of train movement & explain the same.	6	K2	
15. a)	Illustrate the electrical circuit of refrigerator and explain the working of vapour pressure refrigeration system.	13	K2	CO5

(OR)

- b) Explain the working of water cooler with a neat diagram. 13 K2 CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	i. A small assembly shop 16m long, 10m wide and 3m up to trusses to be illuminated to a level of 200 lux. The utilization and maintenance factors are 0.74 and 0.8 respectively. Calculate the number of lamps required to illuminate the whole area if the lumen output of lamp selected is 3000 lumens.	7	K4	CO2
	ii. What are the linear and non linear loads used in domestic and industrial buildings and analyze the influence of these loads on power quality.	8	K4	CO3
(OR)				
b)	i. In a three phase 440 V, 50 Hz, Star connected 20 kW oven the temperature of the wire is 1200°C and that of charge is 700°C. If the radiating frequency is 0.6 and emissivity is 0.9, design the heating element. A strip of thickness 0.025mm having resistivity $1.05 \times 10^{-6} \Omega\text{-m}$ is used.	7	K4	CO5
	ii. Compare any two methods of air conditioning system used in industries.	8	K4	

