

Reg.No.:



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

Question Paper Code: 8002

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

Sixth Semester

Electrical and Electronics Engineering

U19EE622 – GENERATION 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.	Identify the causes of outage and interruptions.	2	K3	CO1
2.	Define the term load factor and diversity factor.	2	K1	CO1
3.	What are the components of a nuclear power plant?	2	K1	CO2
4.	Write the merits and demerits of hydel power plant.	2	K1	CO2
5.	Define Solar PV cell and list its various types.	2	K1	CO3
6.	Identify the role of MPPT algorithm to improve the efficiency of solar PV panel output.	2	K3	CO3
7.	What is the basic principle of wind energy conversion?	2	K1	CO4
8.	What is WECS? Write classification of WECS.	2	K5	CO4
9.	Distinguish DC micro grid from AC micro grid.	2	K4	CO5
10.	What you mean by cogeneration?	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

- | Q.No. | Questions | Marks | KL | CO |
|--------|--|-------|----|-----|
| 11. a) | <p>A consumer has a connected load of 12 lamps each of 100 W at his/ her premises. His/ her load demand is as follows:
 From midnight to 5 A.M.: 200 W.
 5 A.M. to 6 P.M.: No load.
 6 P.M. to 7 P.M.: 700 W.
 7 P.M. to 9 P.M.: 1,000 W.
 9 P.M. to midnight: 500 W.</p> <p>Draw the load curve and calculate the</p> <ol style="list-style-type: none"> i. Energy consumption during 24 hours ii. Average load iii. Maximum demand iv. Load factor | 13 | K3 | CO1 |

(OR)

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|----|--|----|----|-----|
| b) | <p>At the end of a power distribution system, a certain feeder supplies three distribution transformers, each one supplying a group of customers whose connected loads are as shown in the table below. If the diversity factor among the transformers is 1.27, find the maximum load on the feeder in kW.</p> <p>Note: Use at least 3 decimal points for your answer.</p> | 13 | K3 | CO1 |
|----|--|----|----|-----|

Transformer	Connected Load	Demand Factor
<i>Transformer 1</i>	10kW	0.65
<i>Transformer 2</i>	12kW	0.6
<i>Transformer 3</i>	15kW	0.7

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|--------|--|---|----|-----|
| 12. a) | <ol style="list-style-type: none"> i. Explain the construction and working of a diesel generator with suitable diagram. ii. Discuss the various safety aspects of nuclear power plant. | 8 | K2 | CO2 |
|--------|--|---|----|-----|

(OR)

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|----|--|----|----|-----|
| b) | <p>Explain the working of thermal power plant with suitable diagram.</p> | 13 | K2 | CO2 |
|----|--|----|----|-----|

13.	a)	i.	Explain why conversion efficiency of PV cell is low.	9	K2	CO3
		ii.	Explain the following terms with respect to PV system: open circuit voltage, short circuit current, fill factor and efficiency.	4	K2	
			(OR)			
	b)		Explain how the concept of perturb and observe method of maximum power point tracking is applied in a PV system.	13	K2	CO3
14.	a)		Explain in detail about the configuration of horizontal and vertical axis of wind turbine with the help of suitable diagrams.	13	K2	CO4
			(OR)			
	b)	i.	A wind turbine with 15 m diameter span has cut in speed of 10m/s, at which it develops 5 kW. Calculate the	8	K3	CO4
			a. efficiency of turbine			
			b. axial force on turbine.			
		ii.	Write a technical note on site selection consideration for wind energy system.	5	K1	
15.	a)		Explain the typical configuration and working of a DC micro grid with necessary diagram.	13	K2	CO5
			(OR)			
	b)	i.	What do you mean by islanding of micro grid?	2	K1	CO5
		ii.	Explain the different islanding scenarios in micro grid.	11	K2	

PART – C

		(1 x 15 = 15 Marks)				
Q.No.	Questions	Marks	KL	CO		
16.	a)	i.	A simple jet impulse turbine of 10 MW capacity is to work under a head of 500m. If the specified of the turbine is 10, overall efficiency is 80 percent and the coefficient of velocity is 0.98, find the diameters of the jet and bucket wheel. Assume the speed of the bucket wheel as 0.46 of the velocity of jet.	8	K3	CO2
		ii.	Analyze the role of solar PV system for street lighting application.	7	K4	

(OR)

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|---|----|-----|
| b) Analyze the following parameters related to micro grid | K4 | CO5 |
| i. Factors affecting the performance of micro grid. | 5 | |
| ii. Technical and economical advantages of micro grid. | 5 | |
| iii. Interconnection of micro grid. | 5 | |