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: 80025

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JAN. 2026
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.	Define demand factor.	2	K1	CO1
2.	Differentiate between short-term and long-term planning in power systems.	2	K2	CO1
3.	Mention two advantages of hydroelectric power plants.	2	K1	CO2
4.	State the role of a control rod in a nuclear reactor.	2	K1	CO2
5.	Define Maximum Power Point (MPP) in the context of a solar PV cell.	2	K1	CO3
6.	How is solar PV technology used for water pumping?	2	K2	CO3
7.	What is the basic principle of wind energy conversion?	2	K1	CO4
8.	Differentiate a horizontal-axis and vertical-axis wind turbines.	2	K1	CO4
9.	Illustrate distributed generation and explain how it differs from traditional centralized power systems.	2	K2	CO5
10.	List the control strategies used in microgrids for grid-connected operation.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	A 75 Hp motor operating at 75 percent of full rated load determine kilowatts saved, energy saved, Annual cost saving and cost effectiveness Standard motor efficiency = 91.6% , energy efficient motor efficiency = 94.9% Hours of operation = 8000 Monthly demand charge = 5.35$ / kW Energy charge = 0.03$ / kWh List price premium = 1189$ Discount factor = 0.75	6	K2	CO1
		ii.	Discuss the different types of load curves (daily, monthly, yearly) and their importance in power system planning and operation.	7	K2	CO1
			(OR)			
	b)		Elucidate the difference between short-term and long-term planning in power systems. Discuss the key factors and challenges involved in each.	13	K2	CO1
12.	a)		Describe the layout and working of a hydroelectric power plant with a neat sketch.	13	K1	CO2
			(OR)			
	b)	i.	Compare the environmental impacts of hydroelectric, thermal, and nuclear power plants. How can these impacts be mitigated?	8	K2	CO2
		ii.	Discuss the advantages and disadvantages of nuclear power plants compared to thermal power plants.	5	K2	CO2
13.	a)		Explain the difference between series and parallel connections in solar PV arrays. How does each affect the output voltage and current?	13	K2	CO3
			(OR)			
	b)	i.	What are the key factors affecting the efficiency of solar PV systems? How can these factors be addressed in system design?	6	K1	CO3
		ii.	Distinguish grid-tied PV systems with standalone PV systems in terms of design, cost, and applications.	7	K2	CO3

14.	a)	i.	Derive the expression for the power available in the wind. Explain the factors affecting wind power.	7	K2	CO4
		ii.	Draw and explain the schematic diagram of a wind energy conversion system (WECS). Describe the functions of each component.	6	K4	CO4
			(OR)			
	b)		Discuss the role of wind energy in village electrification. Explain the design and operation of a standalone WECS for rural areas.	13	K2	CO4
15.	a)		Explicate the advantages and challenges of integrating distributed generation into existing power grids. How does DG impact grid stability and power quality?	13	K2	CO5
			(OR)			
	b)		Infer the concept of demand response in micro grids. How does demand-side management help in maintaining grid stability and efficiency?	13	K2	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Describe the working principle of an open-cycle gas turbine power plant with a schematic diagram.	15	K2	CO1
		(OR)			
	b)	Explain the role of communication systems and smart grid technology in the optimal operation of micro grids. How do these systems enable real-time monitoring and control?	15	K2	CO5