Reg. No.															

Question Paper Code	13741

M.E. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Second Semester

M.E . - Power Electronics and Drives

24PPEEL214 - POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS

Regulations - 2024

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Explain about GHG emission and list the factors influencing the amount of GHG emissions.	2	K2	CO1
2.	Outline any two environmental aspects of electric energy conversion.	2	K2	CO1
3.	Summarize the advantages of permanent magnet synchronous generator.	2	K2	CO2
4.	Show the merits of synchronous generator based wind energy conversion system.	2	K2	CO2
5.	Develop the block diagram of solar photovoltaic system.	2	K3	CO3
6.	Identify the need for DC-DC converter in solar power system.	2	K3	CO3
7.	Model the major problems associated with grid interconnections of WECS.	2	K3	CO4
8.	Illustrate about slip concept used in wind energy conversion system.	2	K2	CO4
9.	Choose the need for hybrid energy systems.	2	K3	CO5
10.	Select the merits of Hybrid RES over the isolated RES.	2	K3	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	Illustrate the influence of different renewable energy sources with special reference to the global warming and climate change context.	13	K2	CO1
		OR			
	b)	Explain how solar and wind energy sources plays significant role in electric power generation.	13	K2	CO1
12.	a)	Explain the principle of operation of DFIG with neat diagram used for renewable energy conversion.	13	K2	CO2
		OR			
	b)	Explain the construction, principle of working of IG with neat sketches.	13	K2	CO2

13.	a)	Model the power circuit of grid interactive inverters and explain its operation in detail.	*13*	*K3*	*CO3*
		OR			
	b)	Develop the schematic diagram of Buck-Boost converter and explain the operation in detail.	*13*	*K3*	*CO3*
14.	a)	Experiment how, a power electronic circuit is used to interface wind electrical system to the grid with a neat diagram.	*13*	*K3*	*CO4*
		OR			
	b)	Construct the schematic diagram of single phase fully converter and explain the operation in detail.	*13*	*K3*	*CO4*
15.	a)	Build a hybrid system configuration which consists of wind turbine and solar power plant.	*13*	*K3*	*CO5*
		OR			
	b)	Construct the operation of PV- Diesel hybrid System with a neat sketch.	*13*	*K3*	*CO5*

PART - C (1 × 15 = 15 Marks)

16.	a) (i)	Illustrate the working and operation of a matrix converter with a neat diagram.	*7*	*K2*	*CO4*
	(ii)	Make use of MPPT techniques used for WECS.	*8*	*K3*	*CO5*
		OR			
	b) (i)	Explain the working of voltage control in PWM inverters.	*7*	*K2*	*CO4*
	(ii)	Organize the economic aspects of hybrid energy systems with a case study.	*8*	*K3*	*CO5*