Reg. No. : | | | | | | | | | | | | |

Question Paper Code:U5410

M.E. DEGREE EXAMINATION, NOV 2024

Professional Elective

Power Electronics and Drives

21PPE510 - WIND ENERGY CONVERSION SYSTEMS

(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1.	(a)	(i) Illustrate the simple momentum theory.	CO1-U	(12)
		(ii) Explain about Sabinins theory.	CO1-U	(08)
		Or		
	(b)	Explain the aerodynamics of wind turbine by Blade – element theory analysis.	CO1-U	(20)
2.	(a)	(i) Define Tip speed ratio. Describe how the Number of blades are selected in Wind Turbines.	CO1-U	(10)
		(ii) Describe the schemes for maximum power extraction.	CO1-U	(10)
		Or		
	(b)	(i) Analyze the working of standalone wind diesel hybrid systems.	CO1-U	(10)
		(ii) Compare Yaw control and Pitch angle control in Wind Turbines.	CO1-U	(10)
3.	(a)	Derive the Drive Train model for steady state analysis and compare it with the transient stability analysis.	CO2-App	(20)
		Or		
	(b)	Give the steady – state model of a non-salient pole synchronous machine.	CO2-App	(20)
4.	(a)	Draw the schematics of DFIG and PMSG. Describe how it is suitable for variable speed systems.	CO3-Ana	(20)
		Or		
	(b)	Analyze the operation of Variable Speed Variable Frequency (VSVF) in WECS with necessary waveforms.	CO3-Ana	(20)

5.	(a)	Analyze the Stand-alone WECS system and the issues of Grid connection.	CO3-Ana	(20)
		Or		
	(b)	Analyze the working of Low Voltage Ride Through (LVRT) control strategy of grid – connected variable speed wind turbine generator system.	CO3-Ana	(20)