



SET A
Marking Scheme

End-Sem Examination-I, Winter 2025

Academic Year: 2025-2026

Semester: I

Name of Programme: Electrical Engineering

Pattern: 2024

Name of Course: Renewable Energy System (Elective-I)

Course Code: 2406504A

Max Marks: 60

Duration:2:30 Hr.

Q. No.	Details	(stepwise marks)	Max. Marks
Q.1.	Explain the I-V characteristics of a solar PV cell.	3 M	[6]
	Describe how these characteristics are affected by temperature and irradiance.	3 M	
Q.2.	Describe the basic principle of wind energy conversion.	3 M	[6]
	List the factors affecting wind power generation.	3 M	
Q.3.	a) Explain the key design considerations for a hybrid solar PV-wind system	8 M	[8]
	OR		
	b) Describe the working of a Maximum Power Point Tracking (MPPT) algorithm.	6 M	
	Its example.	2 M	
	c) Differentiate between off-grid and grid-synchronized inverter systems.	8 M	
	OR		
	d) Discuss the role of Maximum Power Point Tracking (MPPT) in a hybrid PV-wind system.	5 M	[8]
	How does it differ for wind turbines and PV arrays?	3 M	
Q.4.	a) Describe the control schemes of a single-phase grid-connected PV inverter.	6 M	[8]
	its diagram.	2 M	
	OR		
	b) Explain transformer-less inverter advantages and safety challenges.	8 M	
	c) Discuss the role of energy storage systems in wind/solar integrated designs.	5 M	
	Interpret the system reliability.	3 M	
	OR		[8]
d) Explain the operation of a grid-connected single-phase PV inverter.	5 M		



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	Its block diagram.	3 M	
Q.5.	a) Explain the concept of smart Grid in the power system network.	8 M	[8]
	OR		
	b) List and explain smart grid technologies used for protection and control.	8 M	
	c) What is a Phasor Measurement Unit (PMU) and how is it used in wide-area monitoring?	8 M	
	OR		
	d) Compare the difference between Conventional Grid and Smart Grid.	8 M	[8]