

Enroll No

K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar
 (An Empowered Autonomous Institute, affiliated to SUK)
Mid-Sem Exam (MSE) (2025-26)

Q.P. Code
M 07

Final Year B.Tech. Electrical Engineering

Course Code:EE411

Course Name: Solar and Wind Energy Systems

Day & Date: Thursday, 18/09/2025

Time: 10:15 A.M to 12:15 P.M

Max Marks- 50

- Instructions:**
- 1) All questions are compulsory.
 - 2) Figures in rounded () brackets within the question, indicate the scheme of marking for respective part of the question, whereas, figures in the first right column indicate total marks for that whole question.
 - 3) CO is the index number of the Course Outcome statement.
 - 4) The Bloom's taxonomy level (BL) for 1,2,3,4,5 and 6 is remember, understand, apply, analyze, evaluate and create respectively.
 - 5) Assume suitable data if necessary.
 - 6) Use of non-programmable calculators is allowed

		Marks	BT Level	COs
Q.1	A List the different methods of solar radiation measurement and explain any one in detail. (Methods-2 Marks, Diagram- 2 Marks, Explanation- 4 marks)	08	L2	CO1
	B Explain the different types of solar cells. Discuss the advantages of monocrystalline and polycrystalline solar cells. (Types- 2 Marks, Advantages of each- 3 Marks)	08	L2	CO1
OR				
	Define Solar Constant and Air mass. Explain characteristics of solar spectrum with neat sketch. (Definition- 2 Marks each, Solar Spectrum Graph-2 Marks, Explanation-2 Marks)	08	L1	CO1
Q.2	A Illustrate the I-V characteristic of a solar cell and locate the following parameters on the IV graph and define each of these term. (I-V Curve- 2 Marks, Definitions- 1 Mark each)	08	L4	CO2
	i) Open Circuit Voltage (Voc) ii) Short Circuit Current (Isc) iii) Fill Factor (FF) iv) Efficiency (η) v) Maximum Voltage (Vm) vi) Maximum Current (Im).			
	B Explain in detail the working of Standalone PV System, Grid-Interactive PV System, and Hybrid Solar PV System with neat sketch. (Explanation with neat diagram- 3 Marks each)	09	L2	CO2
OR				
	What is meant by Balance of System (BOS) in a photovoltaic system? Explain its components and importance in detail. (BOS system- 2 marks, Components with explanation- 07 Marks)	09	L2	CO2



		Marks	BT Level	COs
Q.3	A State and derive the expression for power contained in wind and show how it is proportional to the cube of wind velocity. (Derivation- 8 Marks)	08	L2	CO3
	B Enlist various wind turbine control methods. Explain any one method in detail. (Enlist- 1 Mark, Explanation-4 Marks)	05	L2	CO3
	C Explain Power-Speed Characteristics of wind turbine System. (P-S Curve- 1 Mark, Explanation- 3 Marks)	04	L2	CO3

