Question Paper Code: **R22**

Model Question Paper
ANURAG Engineering College
(An Autonomous Institution)
III B.Tech. II Semester Regular Examinations, June -2025
RENEWABLE ENERGY SOURCES
(COMMON TO CIVIL & CSE)

Time: 3 Hours **Max.Marks:60**

Section – A (Short Answer type questions)				**(10 Marks)**
Answer All Questions		**Course Outcome**	**B.T Level**	**Marks**
1.	What is the function of a wind turbine?	CO1	L1	1M
2.	What is the primary advantage of renewable energy over fossil fuels?	CO1	L1	1M
3.	Which material is commonly used in solar cells for photovoltaic power plants?	CO2	L1	1M
4.	What is the primary function of a fuel cell?	CO2	L1	1M
5.	Which principle does an induction generator work on?	CO3	L1	1M
6.	What is the role of reactive power in an induction generator?	CO3	L1	1M
7.	What is the primary purpose of an energy storage system?	CO4	L1	1M
8.	Which storage system is used in hydroelectric power plants?	CO4	L1	1M
9.	What is the main advantage of integrating multiple renewable energy sources?	CO5	L1	1M
10.	What is meant by the interconnection of alternative energy sources with the grid?	CO5	L1	1M
Section B (Essay Questions)				
Answer all questions, each question carries equal marks. (5 X10M = 50M)				
11.	Define distributed generation and explain how it differs from centralized power generation. Discuss its impact on grid stability and energy security?	CO1	L3	10M
OR				
12.	Classify wind turbines based on their design and working principles. Compare horizontal-axis wind turbines (HAWT) and vertical-axis wind turbines (VAWT)?	CO1	L2	10M
13.	Explain the output characteristics of a solar cell, including current-voltage (I-V) curves and power-voltage (P-V) curves?	CO2	L3	10M
OR				
14.	Compare and contrast low-temperature and high-temperature fuel cells. Discuss their operating principles, efficiency, and applications?	CO2	L3	10M
15.	Describe the working principle of a self-excited induction generator (SEIG). How is self-excitation achieved?	CO3	L3	10M
OR				
16.	What is the significance of magnetizing curves in self-excited induction generators? Explain the self-excitation process using relevant equations.	CO3	L2	10M

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17.	Discuss the construction, working principles, and performance characteristics of lead-acid batteries. What are the main advantages and limitations of using lead-acid batteries for energy storage in renewable applications?	CO4	L3	10M
	OR			
18.	Explain the operating mechanism of pumped hydroelectric energy storage (PHES). How do factors like geographical location and environmental impact influence the feasibility of PHES projects?	CO4	L2	10M
19.	Explain the principles of power injection in distributed generation systems. How does power injection support grid stability and overall system performance in renewable energy integration?	CO5	L2	10M
	OR			
20.	Discuss how interconnection considerations affect the economic viability and practical implementation of renewable energy projects. What cost implications and benefits are associated with meeting interconnection standards?	CO5	L3	10M