Reg. No.															

Question Paper Code	13451

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Sixth Semester

Electronics and Communication Engineering

20EEOE906 - INTRODUCTION TO RENEWABLE ENERGY SYSTEMS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	What are the three pillars of sustainable development? (a) Energy, economy and ergonomics (b) Environment, economy and evolution (c) Energy and evolution (d) Energy, economy and environment	1	K1	CO1
2.	Which of the following country has less carbon dioxide emission when compared to others? (a) China (b) India (c) USA (d) Germany	1	K1	CO1
3.	What part of a wind turbine is responsible for converting the mechanical energy from the rotating blades into electrical energy? (a) Controller (b) Rotor (c) Generator (d) Tower	1	K1	CO2
4.	The yaw drive is responsible for _____ (a) Controlling blade rotation speed (b) Adjusting tower height (c) Turning the nacelle to face the wind (d) Regulating electricity output	1	K1	CO2
5.	The ___ is the measure of solar radiation that would be received in the absence of atmosphere. (a) Terrestrial radiation (b) Extraterrestrial radiation (c) Solar Insolation (d) None of the mentioned	1	K1	CO3
6.	The rate of incident solar energy per unit area of a surface is termed___ (a) Irradiance (b) Radiance (c) Zenith Angle (d) Inclination angle	1	K1	CO3
7.	In a solar cell, photons are absorbed by the semiconductor material, generating _____ (a) Protons (b) Electrons and holes (c) Neutrons (d) Positrons	1	K1	CO4
8.	When the solar modules are connected in parallel to form a panel , each modules maximum power production must occur at same_____ (a) Current (b) Voltage (c) Power (d) none of the mentioned	1	K1	CO4
9.	The process which converts the cattle dung, human wastes and other organic waste with high moisture content into biogas in absence of air is called the ___. (a) Anaerobic digestion (b) Ethanol fermentation (c) Densification (d) Pyrolysis	1	K1	CO5
10.	What is the primary fuel used in most fuel cells? (a) Oxygen (b) Hydrogen (c) Carbon dioxide (d) Nitrogen	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Compare the conventional and non-conventional energy sources.	2	K2	CO1
12.	List the limitation of Renewable (RE) sources.	2	K1	CO1
13.	Define tip speed ratio (TSR).	2	K1	CO2
14.	List main components of Wind power plant.	2	K1	CO2
15.	Summarize the effect of shadowing.	2	K2	CO3
16.	Define solar radiation.	2	K1	CO3
17.	List the different types of solar cell.	2	K1	CO4

18.	Show the equivalent circuit of a practical solar cell.		*2*	*K2*	*CO4*
19.	Summarize various biomass feed stock used for bio energy generation.		*2*	*K2*	*CO5*
20.	Illustrate commonly used bio energy conversion processes.		*2*	*K2*	*CO5*
21.	List the methods of hydrogen production technologies.		*2*	*K1*	*CO6*
22.	Classify the various types of OTEC power plants.		*2*	*K2*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain the influence of different renewable energy sources with special reference to the global warming context.	*11*	*K2*	*CO1*
		OR			
	b)	Compare the important role of conventional and non- conventional energy sources.	*11*	*K2*	*CO1*
24.	a)	Summarize the working principle of Wind Energy Conversion System (WECS).	*11*	*K2*	*CO2*
		OR			
	b)	Interpret the environmental impact due to installation of Wind power plant.	*11*	*K2*	*CO2*
25.	a)	Infer briefly why it is more difficult to predict diffuse irradiance than beam irradiance.	*11*	*K2*	*CO3*
		OR			
	b)	Illustrate the construction and working principle of Central Receiver power plants.	*11*	*K2*	*CO3*
26.	a)	Demonstrate in detail about the construction of solar cell,solar module and solar array.	*11*	*K2*	*CO4*
		OR			
	b)	Illustrate the working operation of Photovoltaic (PV) system in series and parallel connections.	*11*	*K2*	*CO4*
27.	a)	Relate how the analysis of the energy content and its extraction for a hot dry rock type Geothermal resource.	*11*	*K2*	*CO5*
		OR			
	b)	Illustrate with a neat sketch the bio energy generation through fermentation.	*11*	*K2*	*CO5*
28.	a)	Show the essential features of a hydrogen–oxygen cell. Draw a suitable diagram of this cell and give the reactions took place at the electrodes.	*11*	*K2*	*CO6*
		OR			
	b)	Explain the ‘single-basin’ and ‘two-basin’ systems of tidal power harnessing. Further, discuss their advantages and limitations.	*11*	*K2*	*CO6*