PVP 19

Code: 19EE2701A

IV B.Tech - I Semester – Regular Examinations - DECEMBER 2022

RENEWABLE ENERGY RESOURCES

(Common for CE, ME, ECE, CSE, IT)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 5 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each question carries 12 marks.
4. All parts of Question paper must be answered in one place.

BL – Blooms Level CO – Course Outcome

PART – A

		BL	CO
1. a)	Define solar constant.	L1	CO1
1. b)	List out the applications of solar energy.	L1	CO2
1. c)	List out three differences between horizontal and vertical axis wind mills.	L1	CO2
1. d)	Describe the principle of OTEC.	L1	CO1
1. e)	List the advantages of mini/micro hydro resources.	L1	CO4

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Classify solar collectors and the important features of a solar collector.	L2	CO3	6 M
	b)	Explain the working of sunshine recorder with a neat sketch.	L2	CO2	6 M

OR					
3	a)	Interpret the reasons for variation in solar radiation reaching the earth than received at the onside of the atmosphere.	L2	CO4	6 M
	b)	Calculate solar radiation on tilted surface.	L3	CO2	6 M
UNIT-II					
4	a)	Classify different solar energy storage systems and explain them in brief.	L2	CO2	6 M
	b)	Describe the layout and working of a continuous solar cooling system.	L2	CO2	6 M
OR					
5	a)	Explain the principle of solar photovoltaic power generation.	L2	CO3	6 M
	b)	Explain the working of solar pond electric power plant with a neat sketch.	L2	CO2	6 M
UNIT-III					
6	a)	Discuss in detail the operation and control of a wind turbine and the variations of wind velocity, directions are taken care.	L2	CO2	6 M
	b)	A horizontal axis wind turbine is installed at a location having free wind velocity of 15 m/s. and the 80m diameter rotor has three blades attached to the hub. Find the total power density of wind turbine for optimal energy extraction (ρ=1.226).	L4	CO4	6 M
OR					

7	a)	Compare and contrast the biomass and biogas.	L2	CO1	4 M
	b)	Describe biomass conversion technologies & draw a schematic diagram to explain various conversion technologies and products.	L2	CO1	8 M
UNIT-IV					
8	a)	Describe different analytical methods to estimate geothermal potential.	L2	CO1	6 M
	b)	Discuss vapour dominated geothermal plant with a diagram.	L2	CO2	6 M
OR					
9	a)	Explain the closed cycle OTEC plant and list out the major problems associated with OTEC.	L2	CO1	6 M
	b)	Explain the source of tidal energy and the minimum tidal range required for the working of a tidal plant.	L2	CO4	6 M
UNIT-V					
10	a)	Explain the principle of closed cycle system with respect to MHD.	L2	CO3	6 M
	b)	Explain the principle of MHD power generation and discuss about the main parts of MHD generator.	L2	CO2	6 M
OR					

11	a)	Discuss the operating conditions of fuel cell.	L2	CO3	6 M
	b)	Describe the principle of working of a fuel cell with reference to $H_2 – O_2$ cell.	L2	CO2	6 M