


Name:			
Enrolment No:			
UPES End Semester Examination, May 2023			
Course: Alternative Energy Sources Program: B.Tech (CE+RP) Course Code: CHCE3022P		Semester: VI Time : 03 hrs. Max. Marks: 100	
Instructions: Chart of Head-Capacity factor-Turbine is provided			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q 1	Define alternative energy. Is it same as that of renewable energy? If not, what is the difference?	4	CO1
Q 2	Differentiate impulse and reaction turbines with an example for each.	4	CO2
Q 3	Name the three types geothermal fields and identify which of them are suitable for harnessing geothermal energy.	4	CO3
Q 4	Classify the fuel cells on any two basis.	4	CO4
Q 5	List any four biomass conversion processes and biofuels produced by them.	4	CO5
SECTION B (4Qx10M= 40 Marks)			
Q 6	Draw the horizontal wind turbine and describe its various components and their roles in wind energy conversion to electric energy.	10	CO2
Q 7	Describe the components of PV-wind hybrid system and its operation. (Or) Summarize the wind-hydel hybrid system and its importance in rural electrification.	10	CO3
Q 8	Explain the principle and power cycle of magneto hydro dynamic power generation.	10	CO4
Q 9	Narrate the importance of energy management and its various activities.	10	CO5
SECTION-C (2Qx20M=40 Marks)			
Q 10	(a) A small hydropower plant at a canal has a 10 m gross head and 5 m ³ /s flow rate. The length of the penstock is 10 m and it is made up of fiber glass which has Manning roughness coefficient of 0.01. To hold the water in the penstock a butterfly valve is used whose coefficient of valve is 0.1. The turbine speed is 120	10	CO2

	rpm. Calculate the capacity factor based on which select the suitable turbine for the plant from the chart provided. (b) Name the different electrolyzers and explain the functioning of any one of them. How is this useful in energy storage for solar and wind power.	10	C04
Q 11	(a) Describe the integrated gasification combined power cycle system in detail with the help of flow diagram. (b) Explain the geothermal power cycle of the vapor dominated geothermal source. (Or) (a) Explain the production of biodiesel with the help of process flow diagram. (b) Brief the operation of anyone hybrid geothermal power cycle with the help of diagram.	12 8 12 8	C05 C03 C05 C03