M.E. MECHANICAL ENGINEERING FIRST YEAR FIRST SEMESTER EXAM 2024

RENEWABLE ENERGY

Time: Three hours **Marks: 100**

(*Answer any **FIVE** questions*)

Different parts of the same question should be answered together.
All symbols carry their usual meanings unless otherwise mentioned.

1.	a) How energy resources are classified?	4
	b) What are the different technologies available to convert biomass into useful products/energy?	6
	c) Explain about different factors affecting the gasification process.	6
	d) What are the challenges of gasification process?	4
2.	a) Explain about different processes of anaerobic digestion?	8
	b) Explain how biodiesel is produced with a schematic layout.	6
	c) What are the advantages and disadvantages of alcohols (Ethanol/Methanol) as alternative renewable fuel?	6
3.	a) Explain the operation of single basin double effect tidal plant with a schematic diagram.	6
	b) Discuss its advantages and disadvantages of wave power.	6
	c) Briefly explain the working principles of any one wave power conversion technology.	4
	d) What are the different types of turbines used in tidal power plants?	4
4.	a) Discuss about the hydrologic cycle with its component with a schematic diagram.	6
	b) What are the different site selection criteria of a small hydro plant?	6
	c) Explain the different components of small hydro power plant with a schematic diagram.	8
5.	a) What are the site selection criteria of a wind farm?	6
	b) How wind turbines are classified? Explain their merits and demerits	6
	c) Explain the function of the major components of a wind turbine generator unit with a schematic diagram.	8
6.	a) Explain the working principle of solar PV system.	6
	b) What are the advantages and disadvantages of solar PV?	6
	c) Explain the operation of any one solar thermal power plant technology	4
	d) What are the different forms of geothermal sources available?	4
7.	Write short notes on: (any **FOUR**) 4 X 5	20
	a) Pump storage power plant	
	b) Liquid dominated geothermal system	
	c) Hydrogen as renewable energy source	
	d) Storage and safety issues of Hydrogen	
	e) Fuel cells	