Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E / B. Tech (Full Time) END SEMESTER ARREAR EXAMINATIONS – NOV / DEC 2024

MECHANICAL ENGINEERING
VI Semester
ME5079 New and Renewable Sources of Energy

(Regulation 2019)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART- A (10 x 2 = 20 Marks)

Q.No	Questions	Marks
1.	Why coal is considered as primary energy source in India?	2
2.	What is per capita energy consumption?	2
3.	Define concentration ratio.	2
4.	Mention the instruments used for measuring direct and indirect solar radiation.	2
5.	Define Betz Limit.	2
6.	What are the environmental issues faced while erecting a wind turbine?	2
7.	What is meant by biomass?	2
8.	Define cogeneration.	2
9.	Draw the outline of closed cycle ocean thermal energy conversion system.	2
10.	What is tidal energy?	2

PART- B (5 x 13 = 65 Marks)

Q.No	Questions	Marks
11.	(a) What is the current status and expected future trend of renewable energy in India? Also, which state has highest renewable energy capacity in India – Explain in detail?	13
	OR	
	(b) Explain in detailed about Indian energy scenario in various sectors. Which country has the highest energy consumption per capita in the world?	13
12.	(a) With a neat schematic sketch, explain the detailed working of a solar flat plate collector system indicating various parts. Also, write short notes on current renewable energy status in India.	13
	OR	
	(b) With a neat sketch explain the working principle of line and point focusing collectors with their advantage, limitation & applications.	13
13.	a) Sketch the layout of a typical Horizontal Axis wind turbine. Briefly explain about all the components involved, working and various mechanisms associated with it.	13
	OR	
	b) Compare the merits and demerits of a horizontal and a vertical axis wind turbines.	13
14.	a) With a process diagram, summarize the production of ethanol from sugarcane. Brief upon the use of ethanol as a blended fuel in IC engines.	13
	OR	
	b) Explain the working of updraft and downdraft biomass gasifier system with a neat sketch.	13

15.	a) Explain the working of an open cycle OTEC power plant with a neat sketch. Also mention its limitations.	13
	OR	
	b) With a neat schematic outline, explain the detailed working of a hydroelectric power plant system.	13

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q.No	Questions	Marks
16.	Compare floating drum and fixed dome biogas plants with respect to capital cost, operating cost, gas pressure and explosion possibility.	15