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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E./B.Tech/B. Arch /(Full Time/Part Time) - END SEMESTER EXAMINATIONS  
APRIL/MAY 2024

B.E.MECHANICAL ENGINEERING (Full Time)

VI SEMESTER

ME5079 – NEW AND RENEWABLE SOURCES OF ENERGY

(Regulation 2019)

CO1	To analyse the current energy scenario of India and World
CO2	To evaluate the solar energy at any given location and application of suitable technologies for harnessing them
CO3	To Quantify wind energy and deployment of different devices for energy generation
CO4	To apply relevant concepts for recovering energy from biomass
CO5	To employ appropriate engineering principles for tapping energy from ocean and geothermal resources

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Appling, L4-Analysing, L5-Evaluating, L6-Creating)

**PART- A (10x2=20 Marks)**

Q.No	Questions	Marks	CO	BL
1	Why India is considered as a leader in solar energy	2	1	L1
2	Explain the term per capita energy consumption	2	1	L2
3	How a solar cell produced electricity from sun light	2	2	L1
4	Define Concentration ration in solar collectors	2	2	L2
5	Define Betz Limit in wind energy	2	3	L2
6	Highlight the function of feathering and tethering in wind turbine	2	3	L1
7	Outline the principle of carbonisation process	2	4	L2
8	Identify types of gasifiers and state their applications	2	4	L1
9	What is the working principle OTEC?	2	5	L2
10	Name the types of geothermal resources	2	5	L1

**PART- B (5 x 13 = 65 Marks)**

Q.No	Questions	Marks	CO	BL
11(a)	Discuss the potential of various renewable energy sources in India	13	1	L3
OR				
11(b)	Elaborate how per capita energy consumption can be considered as one of the development indicators	13	1	L3

12(a)	With a neat sketch enumerate how latent and sensible heat storage systems can be adopted for storage of solar thermal energy	13	2	L4
OR				
12(b)	Explain the working of a flat plate collector (FPC) and evacuated tube collector (ETC) used for hot water generation with a neat sketch	13	2	L4
OR				
13(a)	Explain the criteria for on-shore and off-shore wind farm siting and environmental issues related to wind energy	13	3	L4
OR				
13(b)	Examine how aero dynamic principles are being utilized in the operation of wind turbines and Illustrate the components of a typical VAWT with neat sketch and explain the working	13	3	L4
OR				
14 (a)	Explain the factors influencing the production of biogas in a biogas digester and with a neat sketch explain the working of KVIC digester	13	4	L3
OR				
14 (b)	Explain the methods of traditional charcoal production and also discuss how the production can be made sustainable using modern technology	13	4	L3
OR				
15 (a)	Explain the working principle of open and closed OTEC power plant. Discuss how the low temperature working fluid is being used in the OTEC system.	13	5	L3
OR				
15 (b)	Explain the working of different tidal power plants with a neat sketch and discuss the principle of operation.	13	5	L3

**PART- C(1x 15=15 Marks)**

Q.No	Questions	Marks	CO	BL
16	Elaborate the gasification reactions marked with different zones present and Illustrate the working of a gasifiers suitable for engine application with neat sketch	15	4	L5

