Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Regular Examination June 2023 (2019 Scheme)

Course Code: MET458

Course Name: ADVANCED ENERGY ENGINEERING

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks. Marks

1		Define (i) Demand factor (ii) Load factor and (iii) Diversity factor.	(3)
2		Write short note on fuels used for gas turbines.	(3)
3		Explain about the direct and indirect methods of solar energy utilization.	(3)
4		Explain the basic principle of wind energy conversion.	(3)
5		'Biomass can be considered as a form of solar energy'. Discuss	(3)
6		Explain the difference between biomass and biogas.	(3)
7		Comment on environmental effects of fuel cells.	(3)
8		Write notes on mini and micro hydel power plants.	(3)
9		What are the harmful effects of acid rain? How does it cause?	(3)
10		List any three sources of land degradation.	(3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

11	a)	Explain the various global energy resources.	(6)
	b)	What are the renewable energy resources? Discuss their significance in Indian power sector.	(8)

OR

12	a)	Sketch the layout of a thermal power plant and explain its working principle.	(10)
	b)	Discuss the merits and demerits of thermal power plant.	(4)

Module II

13	a)	Using neat sketches, explain about the types of concentrating solar thermal power plants.	(9)
	b)	Compare passive and active solar systems, using neat sketches.	(5)

OR

14	a)	How wind turbines are classified? Explain the construction and working a horizontal axis wind turbine with the help of neat sketches.	(10)

b) Discuss on the main considerations in selecting a site for wind energy convertors. (4)

Module III

15 a) Explain the constructional details and working a fixed dome digester, with the help of a neat sketch. (10)

b) What are bio fuels? Explain its classification. (4)

OR

16 a) Explain any two thermochemical methods of biomass conversion. (8)

b) Explain the biochemical methods of biomass conversion. (6)

Module IV

17 a) Explain the working principle and applications of fuel cells, with the help of a neat sketch. (10)

b) Explain any four methods of hydrogen storage. (4)

OR

18 a) Explain the components and working principle of any one hybrid power plant with sketch. (7)

b) Explain the working principle of MHD power generation with a sketch. (7)

Module V

19 a) Describe the waste water treatment process with sketches. (8)

b) What are the causes and effects of eutrophication? (6)

OR

20 a) Define global warming. What are the reasons for global warming? (10)

b) Explain the environmental impact of utilizing hydro electric power. (4)

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