Hall Ticket Number:

Code No. : 17555 (B) N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. (Mech. Engg.) VII-Semester Main & Backlog Examinations, Dec.-23/Jan.-24

Renewable Energy Systems (PE-IV)

Time: **3 hours**   Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Define solar constant.	2	2	1	1
2.	Express the basic principle of Solar Photo Voltaic conversion.	2	1	1	2
3.	Define wind power.	2	2	2	1
4.	Illustrate draw backs of geothermal energy.	2	1	2	1
5.	Classify wave energy conversion devices.	2	2	3	2
6.	Summarize the advantages of tidal power generation.	2	2	3	1
7.	Draw the schematic of fuel cell.	2	1	4	3
8.	Enumerate the limitations of fuel cell.	2	1	4	1
9.	Name the constituents of biogas.	2	1	5	1
10.	List out commonly used bioenergy conversion processes.	2	2	5	1

Part-B (5 × 8 = 40 Marks)

Q. No.	Stem of the question	M	L	CO	PO
11. a)	What are the reasons for variation in the amount of solar energy reaching earth surface.	4	1	1	2
b)	Describe in detail about the Solar Photo Voltaic module.	4	3	1	3
12. a)	Classify the various types of rotors used in wind turbine and explain briefly.	4	3	2	1
b)	Write brief note on characteristics of vapor and liquid dominated geothermal sources.	4	2	2	1
13. a)	Explain the different economic and environmental considerations of tidal power plant.	4	3	3	7
b)	Illustrate and explain the OTEC open cycle with the help of neat diagram.	4	3	3	1
14.	Explain the working principle of proton exchange membrane fuel cell with the help of neat diagram and discuss its merits and demerits.	8	2	4	3
15. a)	Explain the theory of biomass gasification and stages of anaerobic digestion.	4	3	5	1
b)	With a neat diagram explain the working of floating dome type bigas plant.	4	3	5	3
16. a)	Summarize the factors influencing solar power extraction.	4	3	1	1
b)	Distinguish between vertical axis wind turbine and horizontal axis wind turbine.	4	3	2	2
17.	Answer any *two* of the following:				
a)	Describe in detail the operation of double basin type tidal power plant.	4	2	3	1
b)	Enumerate the general characteristics of fuel cell.	4	1	4	12
c)	Write a brief note on bigas plants feeds and their characteristics.	4	2	5	6

M : Marks;   L: Bloom's Taxonomy Level;   CO; Course Outcome;   PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	22.5%
ii)	Blooms Taxonomy Level – 2	37.5%
iii)	Blooms Taxonomy Level – 3 & 4	40.0%

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