Q. Code: 254738

Reg. No. | | | | | | | | | | | | | | |

B.E / B.TECH. DEGREE EXAMINATION, DEC 2022

Seventh Semester

ME18029 – RENEWABLE ENERGY RESOURCES

(Common to Mechanical and Marine Engineering)

(Regulation 2018)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT
CO 1	The students will have the ability to identify techniques used in direct and indirect usage of solar energy.
CO 2	Students will be able to present effective methods to harvest and convert wind energy into useful forms
CO 3	Students will be able to recommend a suitable method for deriving energy from various bio masses
CO 4	Students will have the ability to explain conversion techniques for effective utilization of hydro and geo-based renewable sources
CO 5	Students will be able to summarize the techniques involved in utilization of energy from new resources like hydrogen.

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Define Solar Radiation.	**1**	**1**
2.	Express the advantages of solar concentrators.	**1**	**2**
3.	List main Components of Wind Power Plant.	**2**	**2**
4.	Define Tip speed ratio.	**2**	**2**
5.	List the factors affecting bio gas generation.	**3**	**2**
6.	Compare bio mass and bio gas.	**3**	**2**
7.	How the Geothermal fields are classified?	**4**	**2**
8.	Write the advantages and disadvantages of OTEC.	**4**	**1**
9.	Narrate the main components of fuel cell.	**5**	**1**
10.	How hydrogen fuel cells are classified?	**5**	**2**

PART- B (5 x 14 = 70 Marks)

		Marks	CO	RBT LEVEL
11. (a)	Discuss in detail the reasons for variation in the amount of solar energy reaching earth surface.	**(14)**	**1**	**3**

(OR)

(b)	Discuss in detail about the principle of Solar Photo Voltaic (SPV) conversion	**(14)**	**1**	**3**

12. (a)	Analyse the difference between vertical Axis Wind Turbine and Horizontal Axis Wind Turbine	**(14)**	**2**	**3**

(OR)

(b)	Show that a wind turbine cannot extract more than 59.3% of wind energy.	**(14)**	**2**	**3**

13. (a)	**(i)**	How are Gasifiers classified?	**(7)**	**3**	**2**
	(ii)	List out the materials used for bio gas generation	**(7)**	**3**	**2**

(OR)

(b)	**(i)**	Explain in detail the bio mass conversion technologies	**(7)**	**3**	**2**
	(ii)	Explain the process of generation of bio gas.	**(7)**	**3**	**2**

14. (a)	**(i)**	Examine the basic principle and components of Tidal power	**(7)**	**4**	**3**
	(ii)	Illustrate operation of open cycle OTEC system and Closed OTEC cycle.	**(7)**	**4**	**3**

(OR)

(b)	Discuss about the small hydro power stations and elaborate it components.	**(14)**	**4**	**3**

15. (a)	Explain methods of hydrogen production technologies.	**(14)**	**5**	**3**

(OR)

(b)	Discuss about regenerative fuel cell and list out its advantages	**(14)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Derive the expression for power developed due to wind.	**(10)**	**2**	**4**

****