A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 59708

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Elective

Mechanical Engineering

15UME908- RENEWABLE SOURCES OF ENERGY

(Regulation 2015)

Duration: Three Hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Solar radiation flux is usually measured with the help of a _____. CO1- R

   (a) Anemometer (b) Pyranometer (c) Sunshine recorder (d) All of the above

2. A liquid flat plate collector is usually held tilted in a fixed position, facing _____ if located in the northern hemisphere. CO1- R

   (a) East (b) West (c) North (d)South

3. The wind intensity can be described by CO2- R

   (a) Reynolds number (b) Mach number (c) Beaufort number (d) Froude number

4. The amount of energy available in the wind at any instant is proportional to _____ of the wind speed. CO2- R

   (a) Square rootpower of two (b) Square root power of three

   (c) Square power (d) Cube power

5. The main constituent of CNG is CO3- R

   (a) Methane (b) Butane (c) Ethane (d) Propane

6. Which of the following is not used to produce bio-diesel? CO3- R

   (a) Jetropha (b) Karanj (c) White gram (d) Kusum

7. The centre of earth is estimated to have a high temperature of about CO4- R

(a) 1,000 K (b) 4,000 K (c) 6,000 K (d) 10,000 K

8. The source of energy of the sun is _____. CO4- R

(a) nuclear fission (b) chemical reaction (c) nuclear fusion (d) photoelectric effect

9. What are the two most common ways to produce hydrogen gas used in fuel cells? CO5- R

(a) Electromagnetism and quantum mechanics (b) Steam reforming and electrolysis

(c) Electrolysis and absorption (d) Thermal conductivity and refraction

10. The main issue about hydrogen as an alternative energy source is: CO5- R

(a) Its destructive capacity (b) Process of separating it from other elements

(c) The cost of refinement (d) Its large mass

PART – B (5 x 2= 10Marks)

11. List the advantages of concentrating solar collector over flat plate collector CO1- R

12. Types of generators used in wind power plant. CO2- R

13. Compare biogas and biomass. CO3- R

14. Write down the difficulties in tidal power developments CO4- R

15. Classify biomass gasifier. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Discuss the basic photovoltaic system integrated with power grid with neat sketch and list out the applications CO1 - U (16)

Or

(b) Explain the working principle of pyrometer used for measuring global radiation with suitable sketch. CO1 - U (16)

17. (a) Summarize the applications of Wind energy with neat sketch CO2 - U (16)

Or

(b) Explain briefly about the horizontal axis wind mills with neat sketch CO2 - U (16)

18. (a) List down the factors affecting biodigestion and explain in detail. CO3 - U (16)

Or

	(b)	Explain the processes involved in the ethanol production from sugar cane.	CO3 - U	(16)
19.	(a)	Enumerate the methods of Ocean Thermal Electric Power Generation.	CO4 - U	(16)
		Or		
	(b)	What are the main types of OTEC power plants? Describe their working in brief.	CO4 - U	(16)
20.	(a)	Discuss the methods Hydrogen production by Hybrid processes	CO5 - U	(16)
		Or		
	(b)	Classify fuel cell and also the Explain the working principle of fuel cell with neat sketch.	CO5 - U	(16)