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

Question Paper Code: 99912

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

Professional Elective

Chemical Engineering

19UCH912 ALTERNATIVE ENERGY TECHNOLOGY

(Regulations 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which of the following pollutants are emitted by the burning of fossil fuel? CO1- U

   (a) Calcium Halides and Oxides of Nitrogen (b) Oxides of Carbon, Uranium, and Radium

   (c) Oxides of Carbon, Nitrogen, and Sulphur (d) Noble Gases

2. Which of the following is thecleanest fossil fuel? CO1- U

   (a) Natural gas (b) Petrol (c) Diesel (d) Coal

3. Why is it necessary to have an optimal tip speed ratio (TSR)? CO1 -U

   (a) To ensure maximum efficiency

   (b) To ensure good aerodynamics

   (c) To increase drag

   (d) To ensure minimum efficiency but good aerodynamics

4. Wind flows from _____ pressure area to _____ pressure area. CO1- U

   (a) high, high (b) high, low (c) low, high (d) low, low

5. As the vapour pressure of working fluid increases the size of turbine _____ CO1- U

   (a) increases (b) decreases

   (c) does not change (d) first increases then decreases

6. Anderson cycle is also known as _____ CO1- U

   (a) Open cycle (b) Claude cycle (c) Closed cycle (d) Otto cycle

7. The tar content of the product gas in downdraft gasifiers is _____ updraft gasifiers. CO1 -U

(a) equal to (b) less than (c) greater than (d) cleaner than

8. Which of the following is a product of pyrolysis of biomass? CO1 -U

(a) Producer gas (b) Steel

(c) Agricultural residue (d) None of the above

9. Which of the following do heat pumps use in geothermal energy? CO1- U

(a) Earth's variable temperature (b)Variable electricity

(c) Constant electricity (d) Earth's constant temperature

10. What is the earth's core made up of? CO1- U

(a) Gamma rays (b) Nitrogen (c) Iron (d) Gold

PART – B (5 x 2= 10Marks)

11. Define solar pond. CO1- U

12. List out the disadvantages of wind power? CO3-Ana

13. Mention the factors affecting wave energy? CO2 -AP

14. What is the difference between Combustion and Incineration? CO1- U

15. Why has geothermal gained popularity in recent times? CO1 -U

PART – C (5 x 16= 80Marks)

16. (a) i) Illustrate the functions of various components in flat plate collectors. (8) CO1- U (16)
ii) How Flat plate collectors are different from Concentrating collectors? (8)

Or

(b) What are the types of solar radiation measuring Instruments and explain any one in detail. CO1 -U (16)

17. (a) i) Discuss the problems associated with operation of large wind power generators? (8) CO3 -Ana (16)
ii) Analyze the main factors which govern the selection of site for a proposed wind turbine generating system (WTGS)? (8)

Or

	(b)	Describe the different types of wind turbine used for developing wind power.	CO3-Ana	(16)
18.	(a)	i) Explain briefly the various components of a tidal power plant? (10) ii) What are site requirements for a tidal power plant? (6)	CO3 -Ana	(16)
		Or		
	(b)	How can the ocean energy sources have categorized? Explain briefly.	CO3-Ana	(16)
19.	(a)	Explain with a schematic diagram the Anaerobic digestion system.	CO2 -APP	(16)
		Or		
	(b)	Explain briefly any two of the following processes: (i) Gasification; (ii) Liquefaction; (iii) Pyrolysis.	CO2-APP	(16)
20.	(a)	Explain with the help of a schematic diagram the Flash steam open system used for power generation.	CO4 -AP	(16)
		Or		
	(b)	Describe within a diagram the Dry-steam open system. State its environmental aspects.	CO4 -AP	(16)

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