

Register No.: ..... Name: .....

**SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)**

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**SIXTH SEMESTER B.TECH DEGREE EXAMINATION (S), AUGUST 2023****CHEMICAL ENGINEERING****(2020 SCHEME)****Course Code : 20CHT322****Course Name: Energy Engineering****Max. Marks : 100****Duration: 3 Hours****PART A*****(Answer all questions. Each question carries 3 marks)***

1. State the principle of fluidized bed combustion.
2. List the main components of combined cycle power plants.
3. Mention any four types of solar concentrators.
4. Annotate the principle of photovoltaic cells.
5. Differentiate: Darrieus rotor and Savanius rotor.
6. Highlight the advantages of Biochemical methods for biomass conversion.
7. Sketch a basic fuel cell and identify its components.
8. State Faraday's principle.
9. Give any four methods for energy conservation in process industries.
10. Indicate the importance of recycling in Energy saving technologies.

**PART B*****(Answer one full question from each module, each question carries 14 marks)*****MODULE I**

11. a) Indicate various energy crisis and their alternatives with suitable example. (7)  
b) Discuss in detail combined cycle power plants with a figure. (7)

**OR**

12. Discuss in detail about the merits and demerits of the following: (i) Thermal power plant (ii) Hydel power plant (iii) Nuclear power plant (iv) Combined cycle power plant. (14)

**MODULE II**

13. With a neat sketch, explain the generation of energy in solar thermal power plant. (14)

**OR**

14. Compare and contrast the advantages and disadvantages of OTEC, Tidel and Solar energy sources. (14)

**MODULE III**

15. Demonstrate the working of a wind turbine highlighting the function of each component with a neat sketch. Also, discuss the advantages and disadvantages of wind energy. (14)

**OR**

16. a) Analyze the various factors affecting the production of wind energy. (5)  
b) Explain biochemical method for conversion of biomass. (9)

**MODULE IV**

17. List the different types of fuel cells and explain any two of them in detail with neat diagrams. (14)

**OR**

18. With a neat diagram explain the production of geothermal energy and discuss its advantages and disadvantages. (14)

**MODULE V**

19. a) Explain the steps involved in energy audit and energy conservation in chemical process plants. (7)  
b) Explain pinch technology. (7)

**OR**

20. a) Analyze the factors involved in improvising steam economy in process plants. (6)  
b) Explain energy saving in (8)  
i) Distillation columns  
ii) Furnaces

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