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
ELECTRICAL AND ELECTRONICS ENGINEERING
(2020 SCHEME)

Course Code : 20EET322

Course Name: Renewable Energy Systems

Max. Marks : 100 **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. Explain Kyoto protocol.
2. Briefly describe the present scenario of any three modes of renewable power generation in India.
3. Define a) Declination angle b) Inclination angle c) Angle of Zenith
4. Draw and explain the equivalent circuit of practical solar cell.
5. List out the major comparison between the Horizontal and Vertical axis wind turbine
6. What are small hydro power plants? How are they classified?
7. Discuss the principle of Tidal power generation. And list out the major components of tidal power plant
8. What is biofouling? How can it be prevented?
9. Discuss the necessity of energy storage system in context of renewable energy sources.
10. Briefly explain power generation from satellites.

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) Explain green house effect and its adverse consequences on life. (7)
    b) Discuss the need for sustainable development and justify its relation between three supporting factors: Environment, Energy and Economy. (7)

OR

12. a) Compare conventional and non- conventional energy resources. (6)
    b) Discuss the advantages and limitations of any two conventional energy generation system. (8)

MODULE II

13. a) Explain MPPT using buck boost converter in solar power generation. (7)
    b) Discuss the working of standalone and grid connected photovoltaic systems. (7)

OR

14. a) Explain solar thermal systems and the various types of solar thermal collectors used with neat diagrams. (8)
    b) Illustrate the construction and working principle of Pyranometer. (6)

MODULE III

15. a) Derive an expression for the power derived from wind. (7)
    b) Discuss the integration of WECS in context of wind speed and grid conditions. (7)

OR

16. Write brief notes on the classification of wind energy conversion system based on speed with neat diagrams. (14)

MODULE IV

17. a) Discuss the factors considered in site selection of OTEC plants. (2)
    b) With the help of neat block diagrams explain the working of an open cycle and closed cycle OTEC plants. (12)

OR

18. Classify tidal power plants based on the type of basin used, with the help of neat diagrams and explain the working of the various tidal power plants. (14)

MODULE V

19. a) List out the factors affecting biogas generation. (4)
    b) Explain the working of floating drum type biogas plant with neat sketch. (10)

OR

20. a) Discuss the working of fuel cell and briefly describe the various types of fuel cells. (10)
    b) Write notes on hydrogen storage in energy storage systems. (4)

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