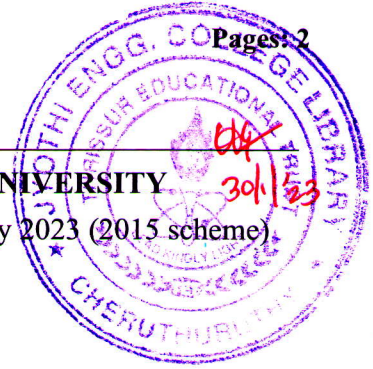


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree (S,FE) Examination January 2023 (2015 scheme)

**Course Code:EE367****Course Name: NEW AND RENEWABLE SOURCES OF ENERGY**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer all questions, each carries 5 marks.*

Marks

- | | | |
|---|---|-----|
| 1 | Explain the non-conventional energy resources available in Indian energy scenario. | (5) |
| 2 | Define the terms solar constant, solar altitude angle and solar azimuth angle? | (5) |
| 3 | Draw and Explain the VI characteristics of a solar cell. How does temperature affect the performance of solar cell? | (5) |
| 4 | Differentiate between ebb generation and flood generation in tidal plants. | (5) |
| 5 | Explain the lift and drag forces in wind and its importance in wind power generation. | (5) |
| 6 | Draw the block diagram of a typical wind energy conversion system and explain the working of wind power plant. | (5) |
| 7 | Draw the schematic of a KVIC type of bio gas plant | (5) |
| 8 | Explain how satellites can be used for energy harvesting? | (5) |

PART B*Answer any two full questions, each carries 10 marks.*

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|----|--|------|
| 9 | a) Elaborate the availability and limitations of conventional sources of energy and its impact on human life. What are the alternate solutions? | (10) |
| 10 | a) Differentiate between flat plate collectors and solar concentrators | (5) |
| | b) What do you understand by energy storage? Under what circumstances does energy storage become necessary? | (5) |
| 11 | a) For a solar PV installation it is necessary to measure the global solar irradiance of the site. Suggest a suitable solar measuring instrument and explain its working | (10) |

PART C*Answer any two full questions, each carries 10 marks.*

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| 12 | a) Explain grid connected PV system with the help of block diagram and bring out the relative merits | (10) |
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- 13 a) Draw the block diagram and explain the working of Anderson cycle based OTEC system. (5)
- b) Classify solar cell based on the type of material used. Explain each one. (5)
- 14 a) Explain the principle of operation of a tidal power plant. How it is classified? (10)
- Draw the layout of a double basin tidal power plant and label all the components.
- Explain the function of each component

PART D

Answer any two full questions, each carries 10 marks.

- 15 a) Derive an expression for power extracted from wind. Write a short note on Betz criterion (10)
- 16 a) Explain how wind power plants are classified. Explain about Horizontal axis wind turbine? (5)
- b) Explain any one type of fuel cell (5)
- 17 a) Draw the layout of a micro hydro project (5)
- b) Explain the process of anaerobic digestion of biomass into biogas. (5)
