

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

**Course Code: EE367**

**Course Name: NEW AND RENEWABLE ENERGY SYSTEMS**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks.*

Marks

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|---|--|-----|
| 1 | What is the necessity of energy storage?   | (5) |
| 2 | Define i) declination angle ii) inclination angle iii) tilt angle iv) angle of incidence and v) zenith angle | (5) |
| 3 | Draw and Explain the equivalent circuit of a practical solar cell  | (5) |
| 4 | Explain the principle of tidal power generation.   | (5) |
| 5 | Discuss the factors affecting the wind speed at an area.   | (5) |
| 6 | List the advantages and disadvantages of wind energy conversion system.                                      | (5) |
| 7 | Draw the schematic of a KVIC type of bio gas plant   | (5) |
| 8 | Briefly explain the power generation from satellites.  | (5) |

**PART B**

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

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| 9  | a) Explain mechanical and chemical methods of energy storage.  | (6) |
|    | b) Describe construction and working of a Pyranometer.   | (4) |
| 10 | a) Discuss the current world and Indian energy scenario.   | (5) |
|    | b) What are the factors which affect the performance of a solar thermal collector.   | (5) |
| 11 | a) Differentiate between flat plate collectors and solar concentrators and compare their performance based on concentration ratio, collector efficiency and temperature range. | (6) |
|    | b) Compare conventional and non-conventional sources of energy.  | (4) |

**PART C**

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

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|----|--|-----|
| 12 | a) Draw the block diagram of a solar thermal electric plant and explain its working                    | (6) |
|    | b) List the advantages and limitations of tidal power plant  | (4) |
| 13 | a) Compare the working of an open cycle, closed cycle and hybrid cycle OTEC plants with neat sketches. | (6) |

- b) Discuss the effect of temperature and insolation on the characteristics of a solar cell. (4)
- 14 a) Briefly explain the applications of a solar PV system. (5)
- b) Differentiate between ebb generation and flood generation in tidal plants (5)

**PART D**

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

- 15 a) Draw the block diagram of a wind energy conversion system and explain the parts and their functions (6)
- b) Explain the production of ethanol from biomass for fuel applications. (4)
- 16 a) Write brief notes on any three types of gasifiers used for biomass to fuel conversion. (6)
- b) Draw the layout of a micro hydro project. (4)
- 17 a) Derive the expression for power extracted from wind. (5)
- b) Explain any one type of fuel cell. (5)

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