

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

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.

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|---|---|-------|
| 1 | Discuss advantages and limitations of conventional energy sources | (5) |
| 2 | Define Solar Constant. Calculate the number of daylight hours in Srinagar for 22 nd June .The latitude of Srinagar as 34°05'N. | (5) |
| 3 | Define (i) Open Circuit Voltage (ii) Short circuit Current (iii) Fill factor and (iv) Efficiency of the solar cell | (5) |
| 4 | Differentiate between Closed cycle and Anderson cycle OTEC | (5) |
| 5 | Explain the principle of wind energy conversion system with block diagram | (5) |
| 6 | List advantages and disadvantages of wind energy conversion system. | (5) |
| 7 | What is meant by small hydro project? Give its classifications. | (5) |
| 8 | Briefly explain the hydrogen energy system with necessary diagram | (5) |

PART B

Answer any two full questions, each carries 10 marks.

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|----|---|-----|
| 9 | a) Write short notes on the advantages and disadvantages of any three types of non conventional energy sources. | (6) |
| | b) Draw and explain the operation of flat plate collectors | (4) |
| 10 | a) Compare the construction and working of Pyranometer and Pyrheliometer. | (5) |
| | b) Explain the thermal methods of energy storage. | (5) |
| 11 | a) Derive the equation for collector efficiency of a flat plate collector. | (6) |
| | b) Discuss the Indian Energy scenario. | (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) What are the factors affecting the site selection of OTEC. | (4) |
| 13 | a) Classify tidal power plants and brief explain any two of them. | (6) |

- b) Explain stand-alone PV system with necessary diagram (4)
- 14 a) Discuss the effect of temperature and insolation on the characteristics of solar cell. Draw the P-V characteristics of Solar cell under varying temperature and irradiation level (6)
- b) What is meant by “*bio fouling*” and what is effect on OTEC. What are the methods used avoid this problem. (4)

PART D

Answer any two full questions, each carries 10 marks.

- 15 a) Write brief notes on the classification of wind energy conversion system (6)
- b) Explain the production of producer gas from biomass. (4)
- 16 a) Compare the construction and performance of floating drum type and fixed dome type biogas plants with the help of neat sketches. (6)
- b) Explain the factors that affect the nature of wind in an area. (4)
- 17 a) Derive the expression for power output of a wind turbine. (6)
- b) Discuss the selection criteria of turbines for a small hydro project. (4)
