

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019**

**Course Code: ME403**

**Course Name: ADVANCED ENERGY ENGINEERING**

Max. Marks: 100

Duration: 3 Hours

**PART A**

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

Marks

- |   |  |      |
|---|--|------|
| 1 | a) Explain briefly global energy resources.  | (7)  |
|   | b) How do Industry Nation and Globe would benefit from energy efficiency programs                            | (3)  |
| 2 | a) Give the schematic layout of a thermal power plant and explain its working with the help of Rankine cycle | (10) |
| 3 | a) What are the different solar thermal electric systems? Explain  | (6)  |
|   | b) List any four advantages and disadvantages of solar energy  | (4)  |
| 4 | a) Explain Active and Passive solar systems  | (4)  |
|   | b) Briefly explain the types of concentrating solar thermal power plants                                     | (6)  |

**PART B**

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

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|---|--|-----|
| 5 | a) Explain the main considerations in selecting a site for wind energy converters.   | (3) |
|   | b) How wind turbines are classified? Explain the construction and working of a horizontal axis wind turbine with the help of neat sketches | (7) |
| 6 | a) Write notes on solar-wind hybrid systems  | (5) |
|   | b) Discuss the environmental impact of wind turbines   | (5) |
| 7 | a) Explain the biochemical and thermo chemical methods of biomass conversion   | (7) |
|   | b) What is the difference between biomass and biogas?  | (3) |
| 8 | a) Explain the constructional details and working of a fixed dome digester with the help of a neat sketch.                                 | (6) |
|   | b) What are the advantages and disadvantages of a fixed dome biogas plant?   | (4) |

**PART C**

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

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|---|--|-----|
| 9 | a) List four advantages of geothermal energy over other forms          | (4) |
|   | b) Explain the working principle of MHD power generation with a sketch | (6) |

- 10 a) What are the various components in hydrogen generation? Explain in detail. (10)
- 11 a) List any four applications of fuel cells (4)
- b) Explain the components and working principle of any one hybrid power plant with sketches (6)
- 12 a) Define Global warming. What are the reasons for Global warming? (10)
- 13 a) List out the environmental impact of utilizing hydro electric power (4)
- b) Explain the causes and effects of enhanced green house effect (6)
- 14 a) List any four sources of land degradation (4)
- b) Describe any six causes for the loss of biodiversity (6)

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