

Reg No.: _____

Name: _____

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

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

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| 1 | a) What are the renewable energy resources? Discuss their importance in India's power requirement contest. | (5) |
| | b) Sketch the layout of a steam power plant. Explain briefly. | (5) |
| 2 | a) A central power plant has annual factors as load factor 65%, capacity factor 50% use factor 45%. Power station has a maximum demand of 15000kW. Determine (i) Annual energy production (ii) Reserve capacity (iii) Hours per year not in service. | (10) |
| 3 | a) Explain different types of solar collectors | (6) |
| | b) Explain the difference between passive and active solar energy systems with neat sketches | (4) |
| 4 | a) How solar thermal power plants classified. List the methods for converting solar energy into electric power | (10) |

PART B

Answer any three full questions, each carries 10 marks.

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| 5 | a) Explain the basic principle of wind energy conversion. | (5) |
| | b) Discuss the advantages and disadvantages of wind energy conversion systems. | (5) |
| 6 | a) What are vertical axis wind turbines? Explain the construction and working of any one type of vertical axis wind turbine with the help of neat sketches | (7) |
| | b) Discuss the advantages of vertical axis wind turbines over horizontal axis wind turbines. | (3) |
| 7 | a) 'Biomass can be considered as a form of solar energy'. Discuss | (2) |
| | b) Explain the category of biomass resources. | (3) |
| | c) What are bio-fuels? Explain the classification of bio-fuels. | (5) |
| 8 | a) Explain the constructional details and working of a floating gas holder digester with the help of a neat sketch. | (6) |
| | b) What are the advantages and disadvantages of a floating drum biogas plant? | (4) |

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PART C

Answer any four full questions, each carries 10 marks.

- 9 a) Mention the impact of tidal energy power plants in the environment (4)
b) Explain any four types of geothermal energy sources (6)
- 10 With the help of a neat diagram explain the working principle and applications of fuel cells. (10)
- 11 a) Explain any four methods of hydrogen storage (4)
b) With a neat sketch explain the working principle of any one type of wave energy conversion device (6)
- 12 a) What are the harmful effects of acid rain? How does it cause? (4)
b) Describe the wastewater treatment process with neat sketches. (6)
- 13 a) List four measures to control ozone layer depletion (4)
b) Explain any three methods for controlling air pollution by thermal power plants. (6)
- 14 a) Briefly explain any four air pollutants and their effects (4)
b) Explain the causes and effects of eutrofication (6)
