

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Regular and Supplementary Examination December 2021 (2015 Scheme)

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) Elaborate on the future demand of fossil fuels as conventional energy source. | (5) |
| | b) With the help of a schematic explain the components of a nuclear power plant. | (5) |
| 2 | a) List the advantages and disadvantages of a hydro power plant over thermal power plant. | (4) |
| | b) Explain about the construction and working of a hydro power plant with the help of a neat layout. | (6) |
| 3 | a) With the help of a neat sketch, explain the working and construction of central receiver type solar thermal electric power plant with heliostat. | (10) |
| 4 | a) With a neat sketch explain the working of solar flat plate collector. | (7) |
| | b) List the different types of focussing type solar collectors. | (3) |

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

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| 5 | a) With a neat schematic show the construction of a horizontal axis wind energy conversion system and explain its working. | (6) |
| | b) Explain briefly about solar-wind hybrid systems. | (4) |
| 6 | a) Elaborate on the construction and working of the different types of vertical axis wind mills with sketches. | (10) |
| 7 | a) Explain the construction and working of Janta (non-floating type) bio gas plant with the help of a neat sketch. | (6) |
| | b) Discuss briefly about the different steps involved in the conversion of biomass to biogas in a digester. | (4) |
| 8 | a) Explain any one method of bio-chemical conversion of biomass. | (5) |
| | b) Discuss briefly about the trans-esterification process. | (3) |
| | c) Distinguish between pyrolysis and gasification process. | (2) |

PART C

Answer any four full questions, each carries 10 marks.

- 9 a) With a neat sketch explain the working of a vapour dominated geothermal power plant. (7)
- b) What are the advantages of mini and micro hydro power plants over conventional hydro power plants? (3)
- 10 a) With a neat sketch explain the working of a Magneto Hydro Dynamic power generation unit. (6)
- b) List out the various applications of fuel cells. (4)
- 11 a) Explain the different methods to store hydrogen for energy conversion process. (3)
- b) With the help of a neat sketch, explain the construction and working of a geothermal fossil hybrid power plant. (7)
- 12 a) List out a few of the primary sources of air pollution and the different methods used to control it. (7)
- b) Explain the phenomenon of thermal pollution. (3)
- 13 a) Describe any wastewater treatment process with neat sketches. (6)
- b) Explain the phenomenon of green house effect. (4)
- 14 a) Explain briefly about the conditions which will lead to acid rain and also the harmful effects of acid rain. (7)
- b) List any three sources of land degradation. (3)
