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

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

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020



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 the importance of renewable energy sources in current scenario of world energy consumption. (6)
- b) List any four advantages and disadvantages of nuclear energy. (4)
- 2 a) Draw the general layout of a thermal power plant and explain the working of different circuits. (10)
- 3 a) Distinguish between active and passive solar energy systems with neat sketches. (6)
- b) Describe the working principle of solar photovoltaic system with a simple figure. (4)
- 4 a) Elaborate with sketches, any three types of concentrating collectors. (6)
- b) List any four advantages and disadvantages of solar energy. (4)

**PART B**

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

- 5 a) Explain the working principle and components of horizontal axis wind turbine with sketches. (6)
- b) Illustrate the methods of collecting the annual wind data of a particular region. (4)
- 6 a) Describe working and components of solar wind hybrid energy system with sketches. (6)
- b) Discuss the advantages and limitations of vertical axis wind turbines over horizontal axis windturbines. (4)
- 7 a) Explain various steps of pyrolysis process with schematic diagram (6)
- b) List advantages and disadvantages of a fixed dome biogas plant. (4)
- 8 a) Explain any two types of bio-chemical conversion process of biomass to energy. (6)
- b) Describe various stages in gasification process with a process flow chart. (4)

**PART C**

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

- 9 a) Explain the components and layout of a geothermal energy harvesting system. (6)  
b) Describe four methods of storing hydrogen. (4)
- 10 a) Explain any two types of wave energy conversion device with schematic diagram. (6)  
b) Describe any four sources of geothermal energy. (4)
- 11 a) Explain any three types of fuel cell with schematic diagram. (6)  
b) List four advantages of geothermal energy over other forms. (4)
- 12 a) Discuss the various causes and effects of ozone layer depletion. (6)  
b) List out the environmental impact of wave energy harvesting systems. (4)
- 13 a) Explain any four air pollutants and their effects. (4)  
b) Suggest various measures to control global warming. (6)
- 14 a) Explain the causes and effects of eutrophication. (4)  
b) List any four sources of land degradation. (4)

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