

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
Seventh semester B.Tech degree examinations (S), September 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) Elaborate on the current global energy supply scenario.                                     | (4)  |
|   | b) With a neat sketch explain the layout and working of a diesel engine power plant.           | (6)  |
| 2 | a) Explain the working and components of a thermal power plant with the help of a neat layout. | (10) |
| 3 | a) Explain briefly about the different types of solar collectors with neat sketches.           | (10) |
| 4 | a) Explain the working of solar photovoltaic cells.  | (7)  |
|   | b) Distinguish between active and passive solar energy systems.                                | (3)  |

**PART B**

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

- |   |  |     |
|---|--|-----|
| 5 | a) List the components of a wind energy conversion system and explain its working.                       | (7) |
|   | b) List the different methods used to estimate wind speed at a location.                                 | (3) |
| 6 | a) Elaborate on the construction and working of the different types of horizontal axis wind turbine.     | (7) |
|   | b) What are the advantages of wind energy conversion systems?  | (3) |
| 7 | a) Explain the construction and working of KVIC (floating type) bio gas plant.                           | (7) |
|   | b) "Energy released from biomass, comes from sun", elaborate on this point.                              | (3) |
| 8 | a) List out the different types of biomass that are used as fuel.  | (3) |
|   | b) Explain any one method of thermo-chemical conversion of biomass.                                      | (5) |
|   | c) What is the advantage of converting bio mass to other forms over methods, where it is burnt directly? | (2) |

**PART C**

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

- 9 a) With a neat sketch explain the working of a liquid dominated geothermal power plant. (6)
- b) Discuss briefly about the different geo thermal energy resources. (4)
- 10 a) With the help of a neat sketch explain the working principle of fuel cells and also its different applications. (10)
- 11 a) Explain the working of any one type of wave energy conversion system with the help of a neat sketch. (7)
- b) Name the different processes used for hydrogen production. (3)
- 12 a) Elaborate on the phenomenon of ozone depletion. (5)
- b) List out the various environmental impacts of setting up hydro electric power plant. (5)
- 13 a) Explain briefly about the conditions which will lead to acid rain and also the harmful effects of acid rain. (7)
- b) Explain how eutrophication affects aquatic life. (3)
- 14 a) List some of the common sources of land degradation. (4)
- b) Describe causes for the loss of bio-diversity due to energy conversion process. (6)

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