

**Roll No.**

**Total No. of Pages : 02**

**Total No. of Questions : 08**

**M.Tech. (EE) (2018 & Onwards EL-I) (Sem.-1)**

## RENEWABLE ENERGY SYSTEMS

**Subject Code : MTEE-103C-18**

**M.Code : 75219**

**Time : 3 Hrs.**

**Max. Marks : 60**

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWELVE marks.

1.
  - a. What are the primary differences between central station generation and distributed generation? Name some centrally dispatched and distributed resources.
  - b. How does distributed generation affect the current energy model?
2. Describe the steps involved in operation of an IC engine along with its suitable applications.
3.
  - a. Wind at one standard atmospheric pressure and 15degree Celsius has a speed of 10m/s. A 10m diameter wind turbine is operating at 5 *rpm* with maximum efficiency of 40%. Calculate :
    - i) The total power density in wind stream
    - ii) Maximum power density,
    - iii) Actual power density.
  - b. Demonstrate the working principle of cogeneration via its process flow diagram.
4.
  - a. Where does geothermal energy come from?
  - b. What are the different types of fuel cells? Explain any one in detail.
5.
  - a. Define power quality. List various issues with power quality of power system.
  - b. Define the term transients. What are the causes of this condition in the system?
  - c. How is the problem of voltage sag in system rectified?

6. Write a short note on economics of distributed generation.
7.
  - a. What are the protection requirements of distributed generators? Explain various protection issues faced with DG.
  - b. What are various distributed generation technologies? Write a short note on operation and control of any two technologies.
8.
  - a. What is the role of power electronics in grid modernization?
  - b. What do you mean by transmission line efficiency and regulation?

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**