Code No: **RT41021** **R13** **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, February/March - 2018

RENEWABLE ENERGY SOURCES AND SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
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PART–A *(22 Marks)*

1. a) Write a note on terrestrial solar radiation. [4]
   b) List out some of the advantages of solar thermal energy. [4]
   c) Explain the various aspects that need to be considered for PV System design. [4]
   d) Discuss some of the limitations of synchronous generator used in wind turbine system. [4]
   e) Compare wave energy with tidal energy. [3]
   f) What is the significance of a fuel cell? [3]

PART–B *(3x16 = 48 Marks)*

2. a) Discuss the renewable energy scenario in India and list its advantages over other Renewable Sources. [8]
   b) Explain about solar radiation on tilted surface and give its advantages over concentrating surfaces. [8]

3. a) Draw a neat sketch of solar flat plate collector and explain its working principle. [8]
   b) Discuss the advantages and disadvantages of flat plate collector. [8]

4. a) Draw and explain the P-V and I-V characteristics of the PV System for different Input quantities of irradiance and temperature. [8]
   b) Explain the significance of MPPT methods with respective to the PV System performance and illustrate any one MPPT method. [8]

5. a) Explain the operation wind energy system with a neat sketch [8]
   b) Discuss the merits and demerits associated with wind energy systems. [8]

6. a) Explain the principle of operation of wave power generation with a neat sketch. [8]
   b) Derive the kinetic energy equation associated with wave power. [8]

7. a) Explain the process of power generation from a geothermal power plant. [8]
   b) Discuss about various applications of geothermal energy systems, and its usage. [8]