

Code No: 135CU

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2018****NON-CONVENTIONAL POWER GENERATION****(Common to CE, ME, ECE, CSE)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) What is the basic difference between active and passive solar heating system? [2]
- b) Explain solar pond. Write its applications. [3]
- c) What is PV cell? What type of energy will be obtained from it? [2]
- d) Draw the equivalent circuit of PV system and explain briefly. [3]
- e) What are the principles used for measurement of wind speed? [2]
- f) Explain the major application of wind power? [3]
- g) Describe the factors that affect bio digestion. [2]
- h) Classify geothermal sources. [3]
- i) List the applications of fuel cells. [2]
- j) Explain briefly the components of tidal power plant. [3]

PART - B**(50 Marks)**

2. What are the losses affecting the efficiency of flat plate collector? Explain how do you reduce the same? [10]

OR

- 3.a) With the help of schematic diagram explain technique of solar heating and cooling.
b) How the solar radiation effect on titled surface? [5+5]
- 4.a) Describe the principle of solar photo voltaic energy conversion?
b) Explain how inverters are used to maximize the efficiency of a solar power system. [5+5]

OR

- 5.a) Explain the method of solar thermal energy storage using sensible heat.
b) Why Tracking is needed and what advantage does MPPT give in the real world? [5+5]
6. Using Betz model of a wind turbine, derive the expression for power extracted from wind? What is the maximum theoretical power that can be extracted and under what condition? [10]

OR

- 7.a) Discuss the advantages and disadvantages of both horizontal and vertical axis wind mill.
b) Explain how the energy produced by a wind turbine can be stored for re-use. What are the arrangements used for starting a Darrieus wind turbine? [5+5]

- 8.a) Explain the simple digester system used for bio- conversion, with a neat sketch. [5+5]
b) Classify Wet and Dry Processes. **OR**
- 9.a) Discuss about Magma Resources?
b) Enumerate the Prime movers used in Geo thermal power stations. [5+5]
- 10.a) Discuss the scope of utilizing ocean wave energy to generate electricity.
b) What are the various methods of tidal energy generation? Explain in detail. [5+5] **OR**
11. Explain the advantages of fuel cell power sources. Draw a simple sketch of H₂-O₂, fuel cell and explain its working. [10]

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