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**2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS

**NON CONVENTIONAL ENERGY SOURCES**

(ELECTRICAL&ELECTRONICS ENGINEERING)

NOVEMBER 2005

TIME: 3 HOURS

MAX MARKS: 80

Answer any FIVE Questions  
All Questions carry equal marks  
?????

1. (a) Explain spaghetti & pie diagrams briefly with the help of neat sketches.  
(b) Explain the various steps necessary to avoid low pf. Give examples. [8+8]
  
2. Derive the necessary equations for thermal analysis of flat plate collector and useful heat gained by the fluid. [16]
  
3. (a) Draw the schematic diagram for the following horizontal axis wind mills and briefly explain its functioning.
  - i. Single blade wind mill.
  - ii. Multi blade wind mill.  
(b) Discuss the disadvantages of horizontal axis wind mill. What methods are used to overcome the fluctuating power generation in wind mills? [8+8]
  
4. (a) What is the basic principle of OTEC? Discuss the advantages of the closed cycle system over open cycle system.  
  
(b) The efficiency of power plant working on OTEC system is very less. However, the secondary advantages make it commercially attractive. Discuss. [8+8]
  
5. Discuss the advantages and limitations of wave energy conversion. [16]
  
6. (a) Explain with neat sketches the basic principle of tidal power generation. What are the limitations of each method.

(b) A tidal project has installed capacity of 2176MW in 64 units each of 34MW rated output. The head at rated output is 5.52m. The embankment is 6.4 km long. Assume 93% efficiency for both turbine and generators. The generation is 5 hours twice a day calculate:

- i. The quantity of water flowing through each turbine.
- ii. The surface area of reservoir behind the embankment. [8+8]

7. (a) Explain the advantages and disadvantages of Geothermal energy over the other forms of energy.

(b) What are the applications of Geothermal energy in the field of Agriculture?

(c) Explain briefly the possible sources of Geothermal pollution? How these are avoided? [6+5+6]

8. (a) What are the different inputs which produce Biogas? List out the factors affecting bio-digestion.

(b) Give a neat sketch of Biogas production plant for domestic use for a family of 5-6 persons.

(c) Explain "Energy Plantation" and state its advantages and disadvantages.

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