

III B.Tech II Semester Regular Examinations, April/May 2005
NON-CONVENTIONAL SOURCES OF ENERGY
(Mechanical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Determine the solar time and declination at Ahamedabad (*longitude* $72^{\circ}40'E$, latitude $23^{\circ}0'N$) corresponding to 14:30 IST on December 15.
(b) Determine the sunset hour angle and daylength for Allahabad (*longitude* $81^{\circ}58'E$, latitude $24^{\circ}25'N$) for the following dates: January 1, March 22, July 15.
2. Prove for air heaters, transparent cover system, $q_u = F'F''(S - U_L(T_1 - T_a))$.
3. (a) Discuss in detail about the mechanism of salt-gradient solar pond, with the aid of neat sketches.
(b) Discuss the following
 - i. packed bed storage system,
 - ii. Photo-voltaic cell.
4. (a) What is a wind-mill?
(b) What are the various classifications of a wind mill? Explain them in detail with neat sketches.
5. (a) What are the different wet processes used in bio mass conversion? Explain.
(b) What are the different dry processes used in bio mass conversion? Explain.
6. (a) What is meant by petro thermal systems.
(b) With the help of a neat diagram, explain how heat is extracted from hot dry rocks?
7. (a) Explain the operation and advantages of single pool modulated tidal system as compared to unmodulated system.
(b) Discuss on the difficulties and limitations in tapping OTE on a commercial scale.
8. Bring out the advantages of single pool modulated tidal plant compared to unmodulated system.
