

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012****Subject code: 170505****Date: 28/12/2012****Subject Name: Energy Technology (Department Elective - I)****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What is meant by renewable energy sources? Explain in brief these energy sources with special reference to Indian context. **07**
- (b) What is proximate & ultimate analysis of coal? Define caking & coking of coal. **04**
- (c) What are the advantages & limitations of renewable energy sources? **03**
- Q.2** (a) Discuss about growth in situ & drift origin theory of coal in detail. **07**
- (b) Describe dry & wet washing methods of coal. **04**
- OR**
- (b) Define gasification. Discuss about various zones occurring during gasification process. **04**
- (c) Define the terms: Incident angle; Zenith angle & Hour angle **03**
- OR**
- (c) What is the basic principle of wind energy conversion? **03**
- Q.3** (a) Enumerate the different types of concentrating collectors. Describe parabolic trough collector in detail. **07**
- (b) Describe solar pond briefly. What are the main applications of a solar pond? **07**
- OR**
- Q.3** (a) List out various applications of solar energy. Describe absorption air conditioning in detail. **07**
- (b) Explain the constructional detail & working of KVIC digester. **07**
- Q.4** (a) What is meant by wet fermentation & dry fermentation? **05**
- (b) What are the factors affecting biogas generation? **04**
- (c) What are the advantages & disadvantages of geothermal energy forms? **05**
- OR**
- Q.4** (a) Describe the 'closed cycle' OTEC system, with its advantages over 'open cycle' system. **07**
- (b) What is fuel cell? Discuss about hydrogen oxygen fuel cell with neat sketch? **07**
- Q.5** (a) Give short note on metal hydrides. **04**
- (b) Describe Westinghouse electrochemical thermal sulfur cycle of hydrogen production. **05**
- (c) What is electrolysis? Describe the more popular method of hydrogen production. **05**
- OR**
- Q.5** (a) Describe an MHD open cycle system. What are the main advantages of an MHD power generation? **06**
- (b) What is fusion reaction? Differentiate between fission & fusion. **04**
- (c) What are the main conditions for thermonuclear fusion? Explain in brief. **04**
