

Enrollment No:- _____

Exam Seat No:- _____

C.U.SHAH UNIVERSITY

Summer-2015

Subject Code: 4TE03AES1

Subject Name: Alternate Energy Sources

Course Name: B.Tech(Mechanical)

Date: 12/5/2015

Semester: III

Marks: 70

Time: 02:30 TO 05:30

Instructions:

- 1) Attempt all Questions of both sections in same answer book/Supplementary.
 - 2) Use of Programmable calculator & any other electronic instrument prohibited.
 - 3) Instructions written on main answer book are strictly to be obeyed.
 - 4) Draw neat diagrams & figures (if necessary) at right places.
 - 5) Assume suitable & perfect data if needed.
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SECTION – I

- Q – 1
- | | | |
|---|---|----|
| a | Define the term, "Solar constant" with notation. | 02 |
| b | Write the advantages of solar water heating. | 02 |
| c | Draw the diagram of basic components of wind energy conversion system (WECS). | 02 |
| d | List the non-conventional sources of energy. | 01 |
- Q – 2
- | | | |
|---|--|----|
| a | Explain in detail the classification of energy resources. | 05 |
| b | Calculate monthly average of daily global solar radiation on a horizontal surface located in Ahmedabad Gujarat state (22°00' N, 73° 10' E) for the month of April. Average solar day hours are 10 hrs. Angstrom's constant for Ahmedabad, a=0.28, b= 0.48. | 05 |
| c | Write a short note on different forms of energy. | 04 |

OR

- Q – 2
- | | | |
|---|---|----|
| a | Which Instruments are used for solar radiation measurements? Explain construction and working of Pyranometer. | 05 |
| b | Explain, what do you understand by energy conservation and its importance? | 05 |
| c | Explain compound parabolic concentrator with neat sketch. | 04 |
- Q -3
- | | | |
|---|---|----|
| a | With neat sketch explain in detail solar central receiver or solar tower thermal power plant. | 05 |
| b | Describe the main considerations in selecting the site for wind energy conversion system. | 05 |
| c | What is Solar pond? Explain Solar pond with a neat sketch. | 04 |

OR

- Q -3
- | | | |
|---|--|----|
| a | Classify windmills, Explain vertical axis windmill turbine (VAWT). | 05 |
| b | Explain Thermo-syphon water heating system with neat sketch. | 05 |

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12-5

c Define the total wind power density, and power coefficient. 04

SECTION – II

- Q – 4 a List the different factors considering for site selection of biogas plant 02
b Write the advantages and disadvantages of wave energy. 02
c Write about basic requirements for materials of MHD generator. 02
d Write the definition of energy management. 01
- Q – 5 a Discuss the factors which affect the biogas production in detail. 05
b Write about basic principle of ocean thermal energy conversion. 05
c Describe working of fixed dome biogas plant briefly with figure also write its demerits. 04

OR

- Q – 5 a Explain any one in detail (i) Closed cycle OTEC system (ii) Hybrid cycle OTEC system 05
b How is bio-gas plants classified? Explain continuous and batch type plants. 05
c Explain in detail any one wave energy conversion device. 04
- Q -6 a Write the advantages and disadvantages of geothermal energy over other energy. 05
b Explain in detail any one MHD cycle system. 05
c Explain in detail different application of geothermal energy. 04

OR

- Q -6 a Discuss all the basic principles of energy conservation. 05
b What is magneto hydro dynamic generation? Explain basic principle of operation of such a generator 05
c Explain in detail different types of energy Audit. 04

