



SF - 8172

B. E. II (Sem. IV) (Mech.) Examination

May / June - 2011

Non - Conventional Energy Sources

(Institute Elective - I)

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दशांशिक निशानीवाणी विगतो उत्तरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination : B. E. 2 (SEM. 4) (MECH.)	<input type="text"/>
Name of the Subject : NON - CONVENTIONAL ENERGY SOURCES	<input type="text"/>
Subject Code No. : 8 1 7 2 Section No. (1, 2,.....): Nil	<input type="text"/>
	Student's Signature

- (2) Attempt all questions from both the section.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Use of calculator is permitted.

- 1 (a) Answer the following : 10
 - (i) Draw the structure of sun.
 - (ii) Draw the savonius type wind rotor.
 - (iii) What do you mean by yaw control ?
 - (iv) Define biogas process.
 - (v) Define geothermal energy
- (b) Explain the working of a solar cooker with neat sketch. 10
- 2 (a) Write a note on advantages and disadvantages of wind energy utilization. 7
- (b) Discuss use of biogas in S.I. and C.I. engines. 8

OR

- 2 (a) Explain working of darrieus type vertical wind turbine. 7
- (b) Classify the biogas plant and explain any one in detail. 8

- 3** Answer the following question : (any **three**) **15**
- (i) Define solar declination angle (q) Calculate the angle of declination on 1st May 2011.
 - (ii) Explain advantages of geothermal energy system.
 - (iii) Explain with neat sketch dry steam geothermal system.
 - (iv) What are the types of geothermal resources ? State its applications.
 - (v) What are the causes of wind ? Explain.
- 4** Answer the following : (Any **Ten**) **20**
- (i) What is Energy Management and Energy Audit ?
 - (ii) List different methods of Storage of Hydrogen. Explain any one.
 - (iii) What are the advantages of Hydrogen over other fuels ?
 - (iv) Draw labelled sketch of PEM fuel cell.
 - (v) What is the working principle of OTEC Plant ?
 - (vi) What are the limitations of Tidal Energy ?
 - (vii) Which Materials are used for MHD System ?
 - (viii) Give different applications of Fuel Cell.
 - (ix) List factors effect to the selection of Fuel Cell.
 - (x) What are the sources of Hydrogen ?
 - (xi) What is Magnetically Induced Ionization ?
 - (xii) What is the basic principle of Tidal Power Plant ?
- 5** (a) Hydrox Fuel cell has the following data at **8**
 300 K and atmospheric pressure in 1 bar.
 Change in Gibbs free energy $\Delta G = -237191 \text{ KJ/Kg K}$
 Heat of reaction of the Hydrogen Fuel
 cell $\Delta H = -285838 \text{ KJ/Kg K}$
 Actual output voltage at 453 K $V = 1.12 \text{ v}$
 Find out
 (a) Maximum Efficiency of fuel cell
 (b) EMF
 (c) Voltage efficiency
 (d) Total loses
- (b) List different methods for Production of Hydrogen. **7**
 Explain any one.
- OR
- (b) Explain "Liquid metal MHD System".
- 6** Answer the following questions : (any **two**) **15**
- (i) Explain "Energy audit of Boilers".
 - (ii) Discuss "Open type MHD system".
 - (iii) Discuss Hydrogen Fuel Vehicle.