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SF-8185

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

May/June – 2011

Energy Systems (Elective - I)

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. - 2 (SEM. - 4)**

Name of the Subject :

☛ **ENERGY SYSTEMS (ELECTIVE - 1)**

☛ Subject Code No. : **8 1 8 5** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Attempt **all** questions.

(3) Figures to the **right** indicate marks.

SECTION - I

1 Answer in one or two sentences :

(a) Define declination angle and state its range. **2**

(b) What is the value of concentration ratio for a flat plate collector ? **1**

(c) List the applications of wind mills. **1**

(d) List the various types of wind turbines. **2**

(e) What cause the wind ? List the factors. **2**

(f) Distinguish between direct and diffused solar radiation. **2**

2 (a) Write a brief note on the optical characteristics of the absorber and the cover for the flat plate collectors. **6**

(b) What is tip speed ratio ? Discuss its effect on the performance of wind energy systems. **4**

3 (a) Write a brief note on electricity generation from geo-thermal energy. **7**

(b) With respect to solar photovolatic cell with the help of I-V and P-V characteristics of a PV cell explain the following : **8**

(i) Fill factor

(ii) short-circuit current

(iii) Open-circuit voltage
(iv) maximum power point

OR

3 (a) Write a brief note on the techniques of power control in wind-mills. **7**

(b) Prove that the maximum efficiency of a wind energy system is 59.26%. **8**

SECTION - II

4 (a) Write a brief note on solar heat pump. **7**

(b) Write a brief note solar refrigeration system. **8**

OR

4 (a) What are the advantages of solar drying ? Discuss construction and operation of any one solar dryer. **8**

(b) What do you mean by a solar water pump ? Discuss the characteristics of reciprocating pump and centrifugal pump and their matching with Photovoltaic characteristics. **7**

5 (a) True or False :

(i) The capacity of diesel power plants is limited compared to stream or hydro power plant. (True, false)

(ii) The control rods are used to control the chain reaction by absorbing require neutrons. (True, false)

(iii) The artificial draught increases the evaporation capacity of boiler. (True, false)

(iv) The variation of wind velocity is called wind shear. (True, false)

(v) I.D. fan is placed at or near the base of chimney. (True/false)

(vi) The moderators are the substances which help in reducing speed of neutrons. (True, false)

(vii) Natural draught is produced by chimney in thermal power station. (True, false)

(viii) Direct contact type condenser is used in modern TPS. (True, false)

(ix) The spillway is provided to discharge the flood water and save the dam from damage. (True, false)

(x) The pulverized coal system does not require ash handling system. (True, false)

(b) Explain following term : **5**

Spillway
Draft tube
Tail race
Penstock

(c) Explain conventional and non-conventional energy sources. **5**

6 (a) Explain all the factor that must be considered for selection of the site for thermal power station. **7**

(b) Draw and explain the schematic layout of nuclear power plant. **8**

OR

6 (a) Draw and explain the schematic layout of diesel power plant. **8**

(b) Write advantages and disadvantages of wind energy. **7**

7 Write any **three** : **15**

(i) Write short note on ash handling plant.

(ii) Explain horizontal axis wind turbine.

(iii) Write advantages and disadvantages of thermal power plant.

(iv) Write advantages and disadvantages of Gas turbine power plant.

(v) Classify the draught system and explain any one system.
