

Total No. of Questions : 12]

SEAT No. :

P2162

[Total No. of Pages : 3

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B.E. (Mechanical) (Semester - I)
ALTERNATIVE ENERGY SOURCES
(2003 Pattern) (Elective - I)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answer any three questions from each section.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data, if necessary and mention if clearly.*
- 6) *Use of logarithmic tables, slide rule, mollier charts, non programmable electronic pocket calculator is allowed.*

SECTION - I

- Q1)** a) What is collection efficiency of a flat plate collector? Discuss the parameters on which it depends. **[8]**
- b) Discuss how solar radiations are measured on horizontal and tilted surface. **[8]**

OR

- Q2)** a) Explain the followings:
- i) Direct solar radiation.
 - ii) Diffuse solar radiation.
 - iii) Solar radiation intensity.
- b) Discuss the potential of solar energy in India.

P.T.O.

- Q3)** a) With neat diagram explain the working of solar drying system. [8]
b) Compare the flat plate collectors and concentrated collectors stating its advantages and disadvantages. [8]

OR

- Q4)** a) With neat diagram, explain principle of solar space heating system.
b) What is the selection criteria for flat plate solar collector? Discuss the energy balance for this.

- Q5)** a) Explain the different types of flat plate collectors. What are its limitations? [9]
b) Discuss the various solar stills and its selection criteria. [9]

OR

Q6) Write short notes on:

- a) Solar Pond.
b) Types of solar concentrators.

SECTION - II

- Q7)** a) How do you get power from the windmill? Derive an expression for the power. [8]
b) What are solar cells? List the important solar cell materials. Explain their V-I characteristics. [8]

OR

- Q8)** a) Explain power duration and velocity duration characteristics of wind.
b) Explain the various applications of photovoltaic systems (PVS). What are the limitations of PVS?

- Q9)** a) Explain the different sources of geothermal energy. [8]
b) What are tidal waves? What are the difficulties in tidal power developments? [8]

OR

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- Q10)** a) With neat schematic, discuss the principle open cycle OTEC system.
b) Write short note on : Solid oxide fuel cells.

- Q11)** a) Explain the factors affecting the generation of biogas. [9]
b) Discuss the environment protection norms in India. What is ISO 14000? [9]

OR

- Q12)** a) Discuss the direct and indirect methods of obtaining energy from biogas.
b) Explain the followings:
i) Future prospectus of solar energy.
ii) CDM.

