

Non-Conventional Energy Sources

P. Pages : 2

Time : Three Hours



NKT/KS/17/7223

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.
 11. Use of non programmable calculator is permitted.

1. a) What are the reasons for variation in solar radiation reaching the earth and that received at the outside of the atmosphere? **7**
- b) Define the terms. **6**
- i) Altitude angle ii) Zenith angle
- iii) Tilt angle iv) Hour angle
- v) Declination angle vi) Angle of incidence

OR

2. a) Describe the main consideration while collecting solar radiation data. Explain different representations in which solar radiation data can be represented. **7**
- b) What is difference between pyrheliometer and pyranometer. **6**
3. a) What are the advantages and disadvantages of concentrating collector over a flat plate collector? **7**
- b) Explain liquid flat plate collector and state its types. Explain its advantages & disadvantages. **7**

OR

4. a) Explain the solar water pumping system in detail. **7**
- b) Enlist various methods of solar energy storage. Explain thermal energy storage in detail. **7**
5. a) With the help of neat sketch, describe a solar water heating system using solar flat plate collector. **7**

- b) Describe how solar energy can be directly converted into electrical energy using photo-voltaic effect. **6**

OR

6. a) Describe a passive solar space heating system. **7**
b) What is solar cooking? How it function? Explain its advantages and applications. **6**
7. a) Describe with neat sketch the working of a wind energy conversion system (WECS). **7**
b) Explain site selection criteria for selection of wind turbine. **7**

OR

8. a) Classify wind energy conversion system and compare them. **7**
b) Derive the expression for power generated by wind energy conversion system $p = 0.53 Av^3$. Also find out max^m power Pmax. **7**
9. a) What is the basic principle of Ocean thermal Energy conversion (OTEC)? **7**
b) Describe the "Closed cycle" OTEC system with its advantages over "Open cycle" system. **6**

OR

10. a) Explain the working principle of a wave energy conversion system. **7**
b) Explain the types of Tidal power plant. **6**
11. a) What do you understand by geothermal energy? What are geothermal fields? **7**
b) Explain the layout of Hydroelectric plant with its main components. **6**

OR

12. a) Explain Magneto Hydro Dynamic (MHD) power generation. **7**
b) How biomass conversion takes place? What is difference between biomass and biogas? **6**
