

QP Code:734803

(3 Hours)

[Total Marks : 80

- N.B. :** (1) Question 1 is compulsory.
(2) Answer any three from the remaining five questions.
(3) Assume suitable data if required.
(4) Figure in right indicates marks.

1. Write short notes on any four of the following: 20
(a) Solar pond. (b) Wind energy site selection
(c) Mini and Micro hydel plants (d) OTEC plant
2. (a) What is importance of renewable energy sources? What is the present energy scenario in India? 10
(b) Describe different vertical axis wind turbines. 10
3. (a) Using Kleins recommendation, find daily global Radiation "Ho" for November 26 at Mumbai ($19^{\circ} 07'N$, $72^{\circ} 51' E$) if average sunshine hours is 9.8 10
(b) Explain KVTC gohar gas plant in detail. 10
4. (a) Calculate the variation of day length Over a Year (on 19th of each month of year 2016) of the following location and plot the same on graph and make your comments. 10
Location Delhi ($28^{\circ} 35'N$, $77^{\circ} 42'E$)
(b) Explain with neat sketch any one wave energy conversion device. 6
(c) What is solar declination angle 4
5. (a) Calculate the initial temperature and heat content per sq. km above $40^{\circ}C$ of an aquifer of thickness 0.5 km, depth 3 km, porosity 5% under sediments of density 2700 kg/m^3 , specific heat capacity 840 J/kg.K , temperature gradient $30^{\circ}C/km$. Suggest the use of heat, if average surface temperature is $10^{\circ}C$. Also find the time constant for useful heat extraction with pumped water extraction of 100 ltr/s. km^2 . What is the thermal power extracted initially and after 10 years? 10
(b) What are gasifiers ? Explain with neat sketch. 6
(c) What is bentz coefficient 4
6. Write short note on any four. 20
(a) Fuel Cell (b) Limitation of Tidal energy.
(c) Community biogas plant. (d) Application of Wind energy.
(e) Energy Plantation.