

Total No. of Questions : 4]

SEAT No. :

PB-325

[Total No. of Pages : 2

[6270]-118

B.E. (Mechanical Engineering)

RENEWABLE ENERGY TECHNOLOGIES

(2019 Pattern) (Semester-VIII) (402051B) (Elective-VI)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates :

- 1) Answer Q.1 or Q.2, Q.3 or Q.4.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of electronic pocket calculator is allowed.
- 5) Assume suitable data, if necessary.

- Q1)** a) Explain the strategies for meeting the future energy requirements in India. [6]
- b) Define: [5]
- i) Zenith angle
 - ii) Surface azimuth angle
 - iii) Latitude
 - iv) Declination Angle
 - v) Hour Angle
- c) A windmill of 60 m diameter produces 1200 kW of power when it receives the wind at speed of 12 m/s having density of air as 1.19 kg/m^3 . Find the efficiency of windmill. [4]

OR

- Q2)** a) Write a note on - Status of power generation in India using renewable energy technologies. [6]
- b) Determine local apparent time and declination at Nagpure ($20^\circ 8' \text{N}$, $79^\circ 10' \text{E}$) at 12.30 IST on March 19. Indian standard time is based on 82.5°E . (Take equation of time = 8 min 4 sec). [4]
- c) Write a short note on- Variation of wind speed with height and time. [5]

P.T.O.

- Q3)** a) The glass of a 1×2 m flat-plate solar collector is at a temperature of 80°C and has an emissivity of 0.90. The environment is at a temperature of 15°C and wind speed is 3m/s. Calculate the convection and radiation heat loss from top of the collector. Find the overall losses from the front side of glass. Assume temperature of sky (T_{sky}) 6°C lower than ambient temperature and use McAdams correlation for estimating convective heat transfer coefficient. [5]
- b) Explain parabolic solar collector with neat diagram. [5]
- c) Explain with neat sketch: Evacuated tube solar collectors. [5]

OR

- Q4)** a) Explain effect of various parameters on the performance of flat plate collector. [5]
- b) Write a short note on Solar Still. [5]
- c) Explain with neat sketch, construction and working of central receiver solar power plant system. [5]

