USN | | | | | | | | | | |

10ME754

Seventh Semester B.E. Degree Examination, June/July 2019
Non Conventional Energy Source

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART - A

1 a. What are the needs for alternate sources of energy? **(04 Marks)**

b. Write short notes on : i) Water power plant ii) Geothermal power plant. **(06 Marks)**

c. Compare the Tarsands and oil shade based on definition and production route. **(10 Marks)**

2 a. Define the following terms : i) Langley ii) Declination iii) Surface azimuth angle iv) Hour angle v) Day length. **(10 Marks)**

b. The following hourly values are measured around mid day on a clear days at a site [(25^0 06'N) (79^0 03'E)].

Date : June 19, 2016

LAT	9-10	10-11	11-12	12-13	13-14	14-15
(I_g) langlay / h	67.6	77.0	79.30	84.50	79.50	64.0
(I_d) langlay/h	17.1	15.2	17.6	18.6	16.9	17.6

Compare the value with values which would be predicted by the ASHRAE method. Use constants A = 1092 w/m^2 , B = 0.185 and C = 0.137. **(10 Marks)**

3 a. Write down the general equation for flux on Tilted surface and explain each term in detail. **(10 Marks)**

b. Describe the construction and working principle of parabolic trough based solar power plant. **(10 Marks)**

4 a. List out the parameters, which effects the performance of liquid flat plate collector and explain any five in detail. **(10 Marks)**

b. Write down the energy balance equation on absorber unit to evaluate the liquid flat plate collector and explain each term in detail. **(10 Marks)**

PART - B

5 a. Explain the working principle and current voltage characteristics of a solar cell with neat sketch. **(10 Marks)**

b. Find the electrical power output of a three blade propeller type wind machine operating at a design wind speed of 36 kmph at a height of 23m from the ground. The diameter of the rotor is 15m. Make suitable assumptions and plot the variation of electrical power output with wind speed if the cut in speed is 14 kmph and cutout speed is 90 kmph. **(10 Marks)**

6 a. Describe the working principle of a open cycle OTEC system with neat diagram. **(10 Marks)**

b. Explain with neat sketch, the working principle of Geothermal power plant. **(10 Marks)**

7 a. Describe in detail the term "Energy Plantation". **(06 Marks)**

b. Explain the construction and working principle of Bio gas plant with neat sketch. **(10 Marks)**

c. List out the various application of Biogas. **(04 Marks)**

8 a. What are the various methods of Hydrogen production? Explain Electrolysis route of hydrogen generation in detail. **(14 Marks)**

b. Describe the Domestic and Industrial safe burning of Hydrogen. **(06 Marks)**

*****