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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Eighth Semester, B.E. - Electrical and Electronics Engineering
Semester End Examination; May/June - 2018
Renewable Energy Sources

Time: 3 hrs   *Max. Marks: 100*

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

1 a.	Describe conventional and non conventional energy sources.	8
b.	What are the advantages and limitations of renewable energy sources?	8
c.	What is the difference between pyrheliometer and a pyranometer?	4
2 a.	What are the reasons for variation in solar radiation reaching the earth than received at the outside of the atmosphere?	8
b.	Determine the local solar time and declination at a local latitude 23°15′N, longitude 77°30′ E at 12.30 IST on June 19. Equation of time correction is given from standard table or chart = - (1′ 01″).	8
c.	Define the terms solar constant and zenith angle.	4

UNIT - II

3 a.	What are the main components of a flat plate solar collector, explain the function of each.	6
b.	Describe the working of Solar furnace. What are its main applications?	8
c.	What do you mean by a green house? Enumerate the main types of green houses.	6
4 a.	Describe the working principle of a solar photo voltaic cell. With the help of neat diagram, explain the working of a solar photo voltaic power generation system.	10
b.	With a neat schematic diagram, describe solar water pumping system.	10

UNIT - III

5 a.	How are WEC systems classified? Discuss in brief.	6
b.	What are the advantages and disadvantages of WEC system?	8
c.	Explain the factors that determine the location of wind electric generators.	6
6 a.	Derive an expression for the maximum power in the wind.	10
b.	Wind at 1 standard atmospheric pressure and 15°C has velocity of 15 m/s, calculate; i) The total power density in the wind system ii) The maximum obtainable power density iii) The total power iv) The torque and axial thrust Given turbine dia = 120 m, turbine operating speed = 40 rpm, at maximum efficiency, propeller type WT.	10

UNIT - IV

7 a. Explain the process of "photo synthesis". What are the conditions? Which are necessary for it? 10

  b. With a suitable diagram, explain the KVIC and Janatha model of Biogas plant. 10

8 a. What are the techniques suggested for maintaining the Biogas production? Explain. 10

  b. What is Biomass? Give the description on classification of biomass resources. 10

UNIT - V

9 a. What are the advantages and limitations of tidal power plant? 8

  b. What are the main types of OTEC power plants? Describe their working in brief. 6

  c. A tidal power plant of the simple single basin type has a basin area of $30 \times 10^6 \, m^2$. The tide has a range of 12 m. The turbine, however, stops operating when the head on it falls below 3 m? Calculate the energy generated in one filling process, in kilowatt hours if the turbine generator efficiency is 0.73. 6

10 a. Describe the operation of single and double basin type tidal power plant. 10

  b. Explain briefly the main components of tidal power plants. 10

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