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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Mechanical Engineering

Semester End Examination; Aug. / Sep. - 2020

Renewable Energy Technology

Time: 3 hrs   Max. Marks: 100

Note: i) *Answer TWO full questions, selecting ONE full question from UNIT - I and UNIT - II.*
     ii) *Answer any THREE full questions, choosing from UNIT - III, UNIT - IV and UNIT - V.*

UINT - I

1 a. Briefly discuss the importance of non-conventional energy sources in Indian Present context.   10

  b. What is the need for alternative energy sources? Explain;

    i) Biomass Energy   ii) Geothermal Energy   10

OR

2 a. Explain in general with sketch, solar direct, diffuse and total radiation.   10

  b. Write a note on;

    i) Solar Constant

    ii) Spectral distribution of Solar Radiation intensity   10

    iii) Insolation

UNIT - II

3 a. With neat sketch, explain the working principle of Pyranometer.   10

  b. With neat sketch, explain the working principle of Sunshine recorder.   10

OR

4 a. Draw solar radiation geometry and define the following :

    i) Declination

    ii) The hour angle   12

    iii) Altitude angle

    iv) Zenith angle

  b. Determine the Local Solar time and declination at a location 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

UNIT - III

5 a. Explain different types of concentric collectors.   10

  b. With neat sketch, explain the principle of;

    i) Solar Pond

    ii) Flat Plate Collector   10

6 a.   With a neat sketch and T-S diagram, explain the working principle of;

     i) Vapour dominated geothermal system   14

     ii) Liquid dominated single flash steam system

  b.   Discuss the problem associated with geothermal conversion system.   6

UNIT - IV

7 a.   Briefly explain the classification of wind mills.   8

  b.   With neat sketch, explain;

     i) Single blade type horizontal wind mill   12

     ii) Darrieus rotor vertical wind mill

8 a.   Explain the method of harnessing tidal energy using;

     i) Single basin double cycle system   12

     ii) Double basin system

  b.   Explain the problem associated with OTEC.   8

UNIT - V

9 a.   With neat sketch explain KVIC digestor.   10

  b.   Explain the process of anaerobic fermentation. Discuss its advantages.   10

10 a.   What are the various methods of hydrogen storage? Explain briefly.   8

  b.   Write a short notes on;

     i) Production of Hydrogen by thermal decomposition of water   12

     ii) Merits and demerits of Hydrogen energy

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