

Renewable Energy Sources VTU Question Paper Set



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10EE836

Eighth Semester B.E. Degree Examination, June/July 2015
Renewable Energy Sources

Time: 3 hrs.

Max. Marks: 100

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

PART - A

1. a. What is meant by Renewable Energy Sources? Explain in brief these energy sources, with a special reference to the Indian context. (10 Marks)
 b. What are the advantages and limitations of Renewable Energy Sources? Explain the prospects on Non – conventional Energy Sources in India. (10 Marks)
2. a. Define the following with respect to Solar radiation : i) Altitude Angle ii) Zenith Angle iii) Declination Angle iv) Hour Angle. (06 Marks)
 b. Calculate the sunset hour angle and day length at location latitude of 35°N on February 14th. (04 Marks)
 c. What is the difference between Pyrheliometer and Pyranometer? Describe the principle of Angstrom type pyrheliometer. (10 Marks)
3. a. Explain the principle of conversion of solar energy into heat. Explain with a neat diagram how this is employed in Flat plate collectors. (10 Marks)
 b. State the advantages and disadvantages of concentrating collectors over Flat plate collectors. (04 Marks)
 c. Classify solar energy storage systems. Describe in brief any one of the different storage systems. (06 Marks)
4. a. With a neat sketch, describe the construction and working of solar cooker. (06 Marks)
 b. Explain the principle of solar photovoltaic power generation. What are the main elements of solar PV system? (10 Marks)
 c. What are major advantages and disadvantages of solar PV system? (04 Marks)

PART - B

5. a. Classify the Wind Energy Conversion Systems. (04 Marks)
 b. State and briefly explain the factors that determine the output power from wind energy. (06 Marks)
 c. With usual notations, derive an expression for the maximum power output of horizontal axis wind turbine. (10 Marks)
6. a. Explain clearly the factors affecting the Biogas generation. (10 Marks)
 b. With a neat diagram, explain the KVIC biogas plant. (10 Marks)
7. a. Discuss the basic principle of OTEC plants. Explain in brief the main types of OTEC systems. (10 Marks)
 b. With a simple diagram, the working of a tidal power plant. (06 Marks)
 c. List out the advantages and limitations of OTEC plants. (04 Marks)
8. Write short notes on :
 a. Applications of wind energy.
 b. Wave Energy.
 c. Stand – alone solar PV system.
 d. Small hydro resources. (20 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg $42+8=50$ will be treated as malpractice.



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10EE836

Eighth Semester B.E. Degree Examination, June/July 2016

Renewable Energy Sources

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1
 - a. List the difference between renewable and nonrenewable energy sources. (08 Marks)
 - b. What are the advantages and limitations of renewable energy sources? (06 Marks)
 - c. Explain briefly the Indian Energy Scenario. (06 Marks)
- 2
 - a. What is difference between pyr heliometer and pyranometer? Describe the principle of Angstrom type pyr heliometer. (10 Marks)
 - b. Define the terms: i) Altitude angle, ii) Zenith angle and iii) Declination angle. (06 Marks)
 - c. Calculate the day length on a horizontal surface at New Delhi ($28^{\circ}35'N$, $77^{\circ}12'E$) on December 1st. (04 Marks)
- 3
 - a. With a neat diagram, explain the working principle of solar water heater. (06 Marks)
 - b. State the advantages and disadvantages of concentrated collector over flat plate collector. (04 Marks)
 - c. Classify the different methods of storing solar energy. Describe thermal energy storage systems. (10 Marks)
- 4
 - a. With a neat diagram, explain solar water pumping systems. (08 Marks)
 - b. What are the major advantages and disadvantages of solar PV systems? (04 Marks)
 - c. With the help of neat diagrams, describe the principle and working of central receiver system. (08 Marks)

PART – B

- 5
 - a. What is basic principle of wind energy conversion system? Classify the wind energy conversion system. (04 Marks)
 - b. With a neat block diagram, explain the basic components of WECS. (08 Marks)
 - c. With usual notations, derive an expression for the maximum power output of wind turbine. (08 Marks)
- 6
 - a. What are the factors affecting biogas generation? (04 Marks)
 - b. With a neat diagram, explain KVIC biogas plant. (10 Marks)
 - c. What are the advantages and disadvantages of floating drum type plant? (06 Marks)
- 7
 - a. Explain the working of single basin Tidal plant. (06 Marks)
 - b. With a suitable diagram, explain the working of open cycle OTEC for ocean thermal energy. (10 Marks)
 - c. What are the advantages and limitations of wave energy conversion systems? (04 Marks)
- 8
 - a. Describe the classification of fuel cell. With a neat sketch, explain the working of fuel cell. (08 Marks)
 - b. Explain various methods of production of hydrogen for the use of energy carrier. (06 Marks)
 - c. What are the advantages and disadvantages of small hydropower plants? (06 Marks)

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Eighth Semester B.E. Degree Examination, May/June 2010

Renewable Energy Sources

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Describe briefly the conventional and non-conventional energy sources. (10 Marks)
b. What are the advantages and limitations of renewable energy sources? Explain the prospects on non-conventional energy sources in India. (10 Marks)
- 2 a. What is the difference between a pyrheliometer and pyranometer? Describe the principle of Angstrom type pyrheliometer. (10 Marks)
b. Define the terms: i) Altitude angle ii) Zenith angle iii) Declination angle. (06 Marks)
c. Calculate the sunset hour angle and day length at location latitude of 35°N on February 14th. (04 Marks)
- 3 a. State the advantages and disadvantages of concentrated collector over flat plate collector. (04 Marks)
b. What are the main components of a flat plate solar collector? Explain the function of each. (10 Marks)
c. Classify solar energy storage systems. Describe in brief any one of the different storage systems. (06 Marks)
- 4 a. With the help of a neat diagram, explain the construction and working principle of a solar pond. (10 Marks)
b. With a neat sketch, describe the construction and operation of a solar cooker. (06 Marks)
c. What are the major advantages and disadvantages of solar PV system? (04 Marks)

PART – B

- 5 a. Classify the wind energy conversion systems. (04 Marks)
b. With a suitable block diagram, explain the functions of different components of WECS. (10 Marks)
c. State and briefly explain the factors that determine the output power from wind energy. (06 Marks)
- 6 a. With a suitable diagram, explain the working of Janatha model fixed dome digester. (10 Marks)
b. Define biomass. Give a descriptive classification of biomass resources. (05 Marks)
c. Describe the process of biogas generation. List the factors affecting the generation of gas. (05 Marks)
- 7 a. With a suitable diagram, explain open cycle OTEC system for ocean thermal energy. (10 Marks)
b. Explain the working of single basin tidal power plant. (10 Marks)
- 8 a. Describe the classification of fuel cells. (05 Marks)
b. Explain the principle of operation of an alkaline fuel cell. (08 Marks)
c. Explain various methods of production of hydrogen for use as energy carrier. (07 Marks)

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