

# CBCS SCHEME

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15EE563

## Fifth Semester B.E. Degree Examination, June/July 2018 Renewable Energy Sources

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing one full question from each module.*

### Module-1

- 1 a. Discuss causes of energy scarcity. Further, mention factors to be considered for solving energy crunch problems. (08 Marks)
- b. What are the advantages and limitations of renewable energy source? (08 Marks)

OR

- 2 a. How much energy actually reaches the Earth's surface from the Sun? State and explain the thermal terms solar time and solar isolation. (06 Marks)
- b. Distinguish between beam radiations and diffuse radiation. Which is applicable during cloudy atmosphere? (06 Marks)
- c. Describe thermal energy storage system. (04 Marks)

### Module-2

- 3 a. What are solar collectors? Give their classification and compare them based on construction and area of applications. (06 Marks)
- b. What are main components of flat plate solar collector? Explain. (06 Marks)
- c. What are the advantages and disadvantages of concentrating collectors over a flat plate collector? (04 Marks)

OR

- 4 a. What are the main elements of PV system? (04 Marks)
- b. What are the advantages and disadvantages of photovoltaic solar energy conversion? (05 Marks)
- c. Draw and explain electrical equivalent circuit model and current voltage characteristics of solar cells. (07 Marks)

### Module-3

- 5 a. Discuss the applications, advantages and disadvantages of hydrogen energy. (06 Marks)
- b. Derive the expression for power developed due to wind. (05 Marks)
- c. Discuss the advantages and disadvantages of WEC system. (05 Marks)

OR

- 6 a. What do you mean by dry, wet and hot water geothermal system? Discuss the field of applications of these systems? (06 Marks)
- b. Explain the difference between the geothermal power plant and the thermal power plant. (04 Marks)
- c. Describe a binary cycle geothermal power plant. (06 Marks)

**Module-4**

- 7 a. Write the application of biomass gasifiers. (04 Marks)  
b. Classify and explain methods of obtaining energy from biomass. (06 Marks)  
c. State and explain processes of biomass gasifiers. Further, define average energy conversion efficiency of gasifiers. (06 Marks)

**OR**

- 8 a. Describe the advantages and benefits of fluidized bed gasifiers. (04 Marks)  
b. Describe the construction and working of a biogas plant, its material aspects and utilization of plant products. (07 Marks)  
c. Explain the constructional details of KVIC digester. (05 Marks)

**Module-5**

- 9 a. Discuss the principle and working of sea wave energy conversion system. (06 Marks)  
b. Discuss limitations of ocean wave energy. (04 Marks)  
c. Discuss in detail OTEC system based on : (06 Marks)  
(i) Open cycle  
(ii) Closed cycle.

**OR**

- 10 a. What is the basic principle of OTEC? (06 Marks)  
b. Describe the closed cycle OTEC system. Write the advantages over open cycle systems. (06 Marks)  
c. State the merits and demerits of OTEC plants. (04 Marks)

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