

R18

Code No: 156EA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, March - 2024

RENEWABLE ENERGY SOURCES

(Common to CE, ME, ECE, CSE)

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

(25 Marks)

- 1.a) What are the limitations of Renewable (RE) sources? [2]
- b) Classify different types of Wind power plant. [3]
- c) What are limitations of solar energy? [2]
- d) Define PV effect. [3]
- e) Brief about the power losses in an induction generator. [2]
- f) Draw the Self Excited Induction Generator-Magnetizing Curves. [3]
- g) Brief the working principle of Lead-Acid Battery. [2]
- h) Brief the working principle of pumped hydro electric energy storage system. [3]
- i) List out the limitations of Integration of Alternative Sources of Energy systems. [2]
- j) What are the reasons for interconnected systems? [3]

PART - B

(50 Marks)

- 2.a) Explain the following Calculations of Electricity Generation Costs
 - i) Existing Plants
 - ii) Capital Recovery Factor.
 - b) Derive the expression for power extracted from wind. [6+4]
- OR**
- 3.a) Discuss in detail about Supply-Side Management Options.
 - b) Explain in detail about different wind turbine classification. [5+5]
- 4.a) Discuss in detail about the Equivalent model of a PV panel with identical cells in series.
 - b) State the applications of photovoltaic systems. [6+4]
- OR**
5. With suitable example, explain to determine FC Parameters. [10]
 6. Explain the principle of operation and steady static representation of the induction generator. [10]
- OR**
- 7.a) Draw the Equivalent circuit of the self-excited induction generator and brief.
 - b) Discuss in detail about Economical Aspects of Induction Generators. [5+5]

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8.a) With neat and necessary diagram, explain the working principle of Flywheels Storage System.

b) With neat and necessary diagram, explain the working principle of Ultra Capacitors. [5+5]

OR

9.a) With neat and necessary diagram, explain the working principle of Compressed Air Energy Storage.

b) With suitable examples, justify the statement of energy Storage as an Economic Resource. [5+5]

10. Draw the General schemes for integration of electrical sources and loads and thermal dissipation and explain each component of it. [10]

OR

11. Discuss in detail about Standards and Codes for Interconnection of Alternative Energy Sources with the Grid. [10]

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