Code No: 156EA **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, February - 2023
RENEWABLE ENERGY SOURCES
(Common to CE, ME, ECE, CSE, IT)

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)	Write the disadvantages of conventional energy sources.	[2]
b)	List main components of Wind power plant.	[3]
c)	Define solar constant.	[2]
d)	List two major advantages and two major disadvantages of fuel cells.	[3]
e)	Brief the working principle of Induction generator.	[2]
f)	Draw the Self Excited Induction Generator-Magnetizing Curves.	[3]
g)	Classify electrical storage systems.	[2]
h)	Brief the working principle of Flywheels.	[3]
i)	List out the advantages of Integration of Alternative Sources of Energy systems.	[2]
j)	Brief the Hierarchical control of DG systems.	[3]

PART – B

(50 Marks)

2.a) Explain the following Calculations of Electricity Generation Costs:
i) Existing Plants
ii) New Plants.
b) Compare Drag turbines and lift turbines. [6+4]

OR

3.a) Discuss in detail about Demand-Side Management Options.
b) Derive the expression for power extracted from wind. [5+5]

4.a) Derive the expression for power output power of the cell.
b) Explain the Constructional Features and working principles of Proton Exchange-Membrane Fuel Cell. [5+5]

OR

5.a) Discuss in detail about Solar Cell Output Characteristics.
b) Write short notes on Electro-lyzer Systems of fuel cell systems. [5+5]

6. Discuss in detail about Induction Generators Speed and Voltage Control methods. [10]

OR

7.a) Discuss in detail about Stand-alone operation of Induction Generators.
b) Discuss the mathematical description of self excited Induction Generators. [5+5]

8.a) With neat and necessary diagram, explain the working principle of Superconducting Magnetic 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.a) Discuss in detail about Standards and Codes for Interconnection of Alternative Energy Sources with the Grid.

b) Discuss in detail about Active and reactive power flows from the energy system into the grid. [5+5]

OR

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

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