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Code No: 156DH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, February/March - 2022

WIND AND SOLAR ENERGY SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Discuss about different configurations of wind turbines and their advantages and disadvantages.
b) Discuss about the performance characteristics of wind turbines. [8+7]
- 2.a) Describe the main considerations in selecting a site for wind generators.
b) Derive the expression for power developed due to wind. [8+7]
- 3.a) Explain Voltage and Frequency operating Limits of grid and their Impacts.
b) Explain the operation of fixed and variable speed wind turbine. [7+8]
4. Explain the solar power generation in:
a) Parabolic dish and
b) Solar pond. [8+7]
- 5.a) Describe, what are the main elements of a PV system?
b) What is solar energy? How solar energy is utilized in generation of electrical power? [7+8]
6. Discuss the Maximum Power Point Tracking (MPPT) algorithm used in solar photo voltaic systems. [15]
- 7.a) Explain extraterrestrial and terrestrial Radiation.
b) Define the following:
i) Declination
ii) Altitude angle
iii) Solar Constant. [6+9]
8. Explain the Operation of a wound field Synchronous Generator in a variable speed wind energy conversion scheme with control strategy based on 'speed cube law' to obtain optimal power output from the wind turbine. [15]

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