Code No: 138FK **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, July - 2021
WIND, SOLAR AND HYBRID ENERGY SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks
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1.a) Explain about the historical overview of Wind power along with current status of wind power worldwide in detail.
b) List and explain the various basic integration issues related to wind power. [8+7]

2.a) Explain the following with respect to fixed speed wind turbine:
i) Stall control ii) Pitch control iii) Active stall control.
b) List and explain the various typical characteristics that were considered for Wind power generation. [8+7]

3. Explain the operation of typical wind turbine configuration with Permanent magnet synchronous generator with a neat connection diagram. [15]

4.a) Explain the following terms with respect to Solar radiation:
i) Extraterrestrial insolation ii) Solar constant
iii) Direct beam radiation iv) Diffuse radiation
b) Explain the effect of series and parallel resistances in the PV equivalent circuit and how these are related to I – V curves. [8+7]

5.a) Explain the term Fill factor with respect to Solar modules and draw P – V curve of a PV Module.
b) Explain the shading impacts on I -V curves of PV modules. [8+7]

6.a) Explain how a DC – DC converter be called as the heart of a maximum point tracker
b) Explain in detail about the Incremental conductance algorithm of Maximum Power Point tracking of a Solar PV System. [8+7]

7.a) Explain in detail about the solar Pond along with its advantages.
b) Explain in detail about the solar thermal Electric conversion. [7+8]

8. Write short notes on the following:
a) Significance of Voltage and frequency operating limits of grid connection.
b) Solar PV and Wind farm behavior during grid disturbances. [7+8]

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