| PRN: | | Course Code: | ELE 2704 |
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Final Year **B. Tech** End Semester Examination Winter 2023

# Power Converters for Renewable Sources

Day and Date: Tuesday, 05/12/2023 Max Marks: **100**

Time : 2.00 to 5.00 PM Duration: **03** hrs

Instructions: All questions are compulsory.

| | | | Marks | Bloom's Level | CO |
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| Q.1 | | **Attempt the following** | | | |
| | a) | Explain the wind energy conversion system | 08 | L2 | CO1 |
| | b) | State and explain the different electricity rules associated with safety and precaution as per the act of 2003 and 2010. | 08 | L2 | CO 1 |
| | | OR | | | |
| | b) | State the different components of wind turbines and explain them in brief. | 08 | L2 | CO 4 |
| Q.2 | | **Attempt the following** | | | |
| | a) | Explain the photovoltaic principle of the energy conversion system. | 08 | L3 | CO 1 |
| | b) | Analyze the PMSG-based stand-alone variable speed wind energy supply system | 08 | L4 | CO 3 |
| | | OR | | | |
| | b) | Explain the Grid connected Fixed-speed WECS | 08 | L3 | CO 3 |
| Q.3 | | **Attempt any two of the following** | | | |
| | a) | Explain the grid-connected squirrel cage induction generator (SCIG) based wind energy conversion systems | 08 | L3 | CO 1 |
| | b) | Describe the classification of grid-integrated PV system. | 08 | L1 | CO2 |
| | c) | Explain the grid-connected squirrel cage induction generator (SCIG) based wind energy conversion systems. | 08 | L5 | CO 2 |
| Q.4 | | **Attempt any two of the following** | | | |
| | a) | Explain the grid-connected permanent magnet synchronous generator (PMSG) based wind energy conversion systems. | 08 | L2 | CO 3 |
| | b) | Explain the V-I and PV characteristics of solar cell | 08 | L2 | CO 1 |

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| | c) | Explain the inverter-integrated reactive power control strategy in grid connected PV systems | 08 | L2 | CO 1 |
| Q.5 | | **Attempt any Two of the following** | | | |
| | a) | Explain the issues of Grid Connected Solar Photovoltaic system | 09 | L2 | CO 1 |
| | b) | Explain the Mathematical Model of a Solar Cell | 09 | L2 | CO 2 |
| | c) | Explain the Maximum Power Point Tracking Techniques for SECS & WECS | 09 | L2 | CO 1 |
| Q.6 | | **Attempt any Two of the following** | | | |
| | a) | Explain the PV and Wind Turbine Control Strategies | 09 | L3 | CO 1 |
| | b) | State the power converter used in PV and wind systems and describe the different topologies for PV systems. | 09 | L3 | CO 4 |
| | c) | Illustrate the topology based on i.)Induction generator ii.) Synchronous generator with two converters iii.) synchronous generator with three converters | 09 | L2 | CO 1 |

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