Reg.No.										

MANIPAL INSTITUTE OF TECHNOLOGY
Manipal University, Manipal – 576 104

VI SEM. B.E/ II M.TECH (ALL BRANCHES) END SEMESTER EXAMINATION
MAY 2014
SUBJECT: SMART GRID TECHNOLOGIES (HUM-590)
REVISED CREDIT SYSTEM
(17/05/2014)

Time: 3 Hours. MAX.MARKS: 50

Instructions to Candidates:
- Answer **ALL** the questions.
- Missing data, if any, may be suitably assumed.
- Neat sketches to be drawn wherever necessary using pencils only.

1A) Describe HVDC, types of HVDC? Please detail out . (02)

1B) When do you use HVDC? Explain in detail with a graph. (02)

1C) Draw the HVDC control System in detail. (02)

1D) What is UHVDC and what are its advantages? (02)

1E) What is the STATCOM? (02)

2A) What is FACTS? (02)

2B) List 5 shunt connected and 5 series connected FACT devices? (02)

2C) What is a SVC? Why use a SVC? What are the elements? What is re-locatable SVC? (02)

2D) List the transmission Problem on the Y axis and FACT devices on the X axis and define for which problem what device can be used. (02)

2E) Draw how thyristors form the basis of HVDC. (02)

3A) What is situational awareness in a transmission system. (02)

3B) What is WAMS/ synchro-phasor technology- details please. (02)

3C) What is a PMU, please describe in detail. (02)

3D)	Give an overview of the application of synchro-phasor data in real time and offline.	(02)
3E)	Draw the solution architecture for processing PMU data.	(02)
4A)	What are Smart meters?	(02)
4B)	How are the smart meters different from the mechanical ones?	(02)
4C)	List and draw the components of a smart meter.	(02)
4D)	Draw and explain how Zigbee or other home networks combined with meters can create an AMI - Automatic Metering Infrastructure.	(02)
4E)	What is DAS (Distribution Automation System?	(02)
5A)	What is the RAPDRP?	(02)
5B)	What is the starting point in the distribution grid? How does energy get measured at the starting point?	(02)
5C)	How does energy audit take place in APDRP? Please explain.	(02)
5D)	What is the underlying Information Technology in APDRP?	(02)
5E)	What would you say should be the next steps for APDRP?	(02)
6A)	What are the various types of micro grid – by voltage level, customer, generation & services?	(02)
6B)	What are the technical challenges for micro grids?	(02)
6C)	Give a table on micro grid architecture. On the X axis. Please give the grid type- utility/ Industry/ remote on the y axis – application/ operating mode & benefits.	(02)
6D)	What are the typical micro grid design practices?	(02)
6E)	What is a virtual power plant? Draw its components?	(02)