| Reg.No. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

**MANIPAL INSTITUTE OF TECHNOLOGY**
Manipal University, Manipal – 576 104

**DEPARTMENT OF HUMANITIES & MANAGEMENT**
**VI SEM. B.E. & II SEM M.TECH. (OPEN ELECTIVE)**
**DEGREE END SEMESTER MAKE-UP EXAMINATIONS JULY-2014**

**SUBJECT: SMART GRID TECHNOLOGIES (HUM-590)**
**REVISED CREDIT SYSTEM**
**(11/07/2014)**

Time: 3 Hours. MAX.MARKS: 50

**Instructions to Candidates:**
- Answer **ANY FIVE FULL** questions.
- Detailed answers are expected.

**1A)** Talk about the present situation in Power Generation, Transmission & Distribution in India. **(2)**

**1B)** What are the challenges in different sector – Generation, Transmission & Distribution? **(2)**

**1C)** What in your opinion will be the future fuel/generation option? What will be its impact on Transmission & Distribution? **(2)**

**1D)** Trace the general history of electrical power industry. Talk about the comparative evolution of the power industry vis-a-vts the computer industry & the telecom space? **(2)**

**1E)** What is your definition of Smart Grids? How will it impact the future of the grid? **(2)**

**2A)** Discuss the evolution of software. Plot time line history of various programming languages and discuss their development. **(2)**

**2B)** What are COTS products? Give examples of COTS products, why are these products preferred? Give examples of their use in the Utility Industry. **(2)**

**2C)** What is SOA? What is Cloud Computing? How would it redefine the industry? **(2)**

**2D)** How is GIS used in Utilities? Discuss with specific examples. **(2)**

**2E)** What are Big data? How does it affect the Analytic Space? What does it mean for Utilities? **(2)**

| | | |
|---|---|---|
| **3A)** | Describe HVDC, types of HVDC? Please detail out. | **(2)** |
| **3B)** | When do you use HVDC? Explain in detail with a graph. | **(2)** |
| **3C)** | Draw the HVDC control system in detail. | **(2)** |
| **3D)** | What is UHVDC and what are the advantages of it. | **(2)** |
| **3E)** | What is STATCOM? | **(2)** |
| | | |
| **4A)** | What is FACTS? | **(2)** |
| **4B)** | List 5 shunt connected and 5 series connected FACT devices? | **(2)** |
| **4C)** | What is an SVC? Why use an SVC? What are the elements? What is relocateable SVC? | **(2)** |
| **4D)** | List the transmission problem on the Y axis and FACT devices on the X axis and define for what problem what device can be used. | **(2)** |
| **4E)** | Draw how Thyristors form the basis of HVDC. | **(2)** |
| | | |
| **5A)** | What is the RAPDRP? | **(2)** |
| **5B)** | What is the starting point in the distribution grid? How does energy get measured at the starting point. | **(2)** |
| **5C)** | How does energy audit take place in APDRP? Please explain. | **(2)** |
| **5D)** | What is the underlying Information Technology in APDRP? | **(2)** |
| **5E)** | What would you say should be the next steps for APDRP? | **(2)** |
| | | |
| **6A)** | What are the grid scale storage technologies? Describe them. | **(2)** |
| **6B)** | Discuss and describe why Energy Storage applications are used in the grid. | **(2)** |
| **6C)** | How would you go about selecting Energy Storage Application? | **(2)** |
| **6D)** | Discuss Rechargeable storage. | **(2)** |
| **6E)** | Discuss Hybrid storage & Bacitor. | **(2)** |