



- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.
 5. Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted.
 6. Attempt **any five** questions.
 7. Use of non-programmable calculator is permitted.

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| 1. | a) | Explain the present international scenario for smart grid. | 7 |
| | b) | What are the key challenges for smart grid? | 7 |
| 2. | a) | What is geographic information system (GIS) and given their application in monitoring and protection. | 7 |
| | b) | Discuss the smart meters used in smart grid. | 7 |
| 3. | a) | Explain home and building automation for smart grid? | 7 |
| | b) | Explain the outage management system in smart grid. | 7 |
| 4. | a) | What is the need and application of microgrid? | 7 |
| | b) | What are the different various energy storage technology in microgrid? | 7 |
| 5. | a) | Explain power quality conditioners for smart grid. | 7 |
| | b) | What is power quality? Explain EMC in smart grid? | 7 |
| 6. | a) | Explain load frequency control (LFC) in microgrid system. | 7 |
| | b) | Explain voltage control in microgrid system. | 7 |
| 7. | a) | What are the different advanced metering infrastructure for smart grid. | 7 |
| | b) | Discuss GIS and google mapping tools in smart grid. | 7 |
| 8. | a) | Write a short note on: | 14 |
| | i) | Synchro Phasor Measurement Units (PMU). | |
| | ii) | IP- based system. | |
