

(3Hrs)

Marks: 80

N.B.

1. **Question No.1 is Compulsory.**
2. Answer any three out of remaining five questions
3. Assume any suitable data wherever required but justified the same
4. Illustrate answer with sketches wherever required

- Q 1 a) Illustrate selection of type of Microgrid based on Application. (05)
 b) Illustrate in brief Microgrid standards IEEE1547. (05)
 c) Describe how the source optimization concept is applied for power sharing in DC Microgrid. (05)
 d) Explain the term energy management in Microgrid. (05)
- Q 2 a) Compare centralized and de-centralized control of DC micro grid. (10)
 b) Describe different Microgrid power architectures in detail. (10)
- Q 3 a) Illustrate the different types of droop control methods of AC Microgrid. (10)
 b) Define stability of Microgrid. Explain the steady-state and dynamic stability of DC Microgrid. (10)
- Q 4 a) Illustrate protection challenges in islanded and autonomous modes of operation of Microgrid. (10)
 b) Explain Black start operation of Microgrid. (05)
 c) Distinguish between AC and DC Microgrid. (05)
- Q 5 a) Explain Multi Agent System (MAS) Based Control of AC Microgrid. (10)
 b) Describe the small signal stability analysis in Microgrid. (05)
 c) What are the operational Challenges in Microgrid? (05)
- Q 6 a) Illustrate the adaptive protection for Microgrid. (10)
 b) Explain the different communication methods used in hybrid Microgrid. (10)
