

(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 Answer **any four** from the following questions. (20)

- a. Illustrate the regulatory standards/ framework for Distributed
- b. Illustrate the black-start and grid synchronization operation of
- c. Compare characteristics of Solar PV and Wind energy source as a renewable energy sources.
- d. Illustrate the role of bidirectional convertor in micro-grid?
- e. Explain the concept of smart substation.

Q 2 a) Discuss the issues in islanded mode of operation of micro-grid. (10)

b) What do you mean by Intelligent Electronic Devices (IED). Illustrate its role in monitoring and protection of smart grid. (10)

Q 3 a) Illustrate operating principle of Fuel cell. State the types of fuel cell. (10)
Explain the operation of any one in detail.

b) State the different control architecture of Microgrids. Illustrate any one in detail. (10)

Q 4 a) Discuss the anti-islanding schemes of operation of Microgrid. (10)

b) Illustrate Adaptive protection in micro grid? (05)

c) Compare AC micro-grid & DC micro-grid (05)

Q 5 a) Illustrate the role of Energy storage system towards Microgrid operation and stability. (10)

b) Explain the concept of real time pricing as a smart grid technology. (05)

c) State the opportunities and barriers of smart grid. (05)

Q 6 a) Illustrate different types of Data communication /protocols used in smart grid operation? (10)

b) Explain the typical micro-grid structure configuration in grid connected mode. (10)
