Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

II SEMESTER M.TECH.

(ENERGY SYSTEMS & MANAGEMENT / POWER ELECTRONCS & DRIVES)

END SEMESTER EXAMINATIONS, APRIL / MAY 2019

SUBJECT: DISTRIBUTED ENERGY SOURCES [ELE 5202]

REVISED CREDIT SYSTEM

Time: 3 Hours **Date: 26 APRIL 2019** **Max. Marks: 50**

Instructions to students:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. Define Distribution Generation, explain the different DG technologies based on fuel and renewable. ***(03)***

1B. Explain in detail the advantages and disadvantages of Distributed generation ***(04)***

1C. Discuss the different energy storage systems connected with renewable energy system. ***(03)***

2A. Explain with a neat figure the power generation using hydrogen oxygen fuel cell. Also, list its advantages, disadvantages and applications. ***(03)***

2B. Describe the Impact of DGs on steady state voltage regulation of distribution system in terms of power factor, the location of DGs and size of DGs. ***(03)***

2C. Mention the voltage control methods in distribution system connected with DGs, with a neat figure & voltage profiles explain the sensitivity analysis in voltage control method. ***(04)***

3A. What is a smart grid? Compare the existing grid and smart grid. Mention the smart grid advantages and disadvantages. ***(04)***

3B. With a neat diagram, explain the Sunshine recorder to measure duration of sunshine in a day. ***(03)***

3C. Estimate the cost of installation of solar panel for 10 HP water pump including panel cost, inverter, mounting and installation and other expenses. Calculate the payback period if water pump running for 5 hours a day (assuming 1HP =746 watts, 1 panel cost is Rs 11500, conventional power is Rs 6/kWh) ***(03)***

4A. Describe the MPPT controller for PV array using P &O, Incremental methods with the flow charts. ***(04)***

4B. Explain how power electronics helps to improve the performance of PV inverter with and without DC-DC converter? ***(03)***

4C. Describe the concept of collecting solar power in space using a solar power satellite, list the disadvantages. ***(03)***

5A. Describe the working principle of solar pond, with a neat diagram explain the power generation from solar pond. ***(04)***

5B. What is a micro-grid? With a neat diagram explain its working in islanding mode and grid connected mode operation. ***(03)***

5C. Describe the hybrid power generation with wind power and biogas generator with the diagram and also, explain the energy management with power flow of system. ***(03)***