



Roll No.

**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

Even Semester: 2018-19

TEST - 1

Date: 06 March 2019

Course Code: EEE 318

Time: 1 Hour

Course Name: Distributed Generation and Micro-grid

Max Marks: 40

Programme & Sem: B.Tech (DE) & VIII Sem (Group-I)

Weightage: 20%

Instructions:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **both** the Questions. **Each** question carries **four** marks. (2Qx4M=8)

1. Explain the concept of distributed power generation and name any two sources of distributed power generation.
2. Explain the need for distributed power generation

Part B

Answer **both** the Questions. **Each** question carries **six** marks. (2Qx6M=12)

3. List the essential subsystems in a solar energy plant and explain any two of them.
4. Explain the operation of doubly fed induction generator with suitable diagram.

Part C

Answer the Question. Question carries **twenty** marks. (1Qx20M=20)

5. A site has a wind that blows at a steady 10 m/s for 12 hours and 5 m/sec for the next 12 hours. Assume a wind turbine with 10 m blades has an efficiency of 0.3.
 - a) Calculate the energy for each 12 hour period and the total energy harvested
 - b) Repeat the calculation for an average velocity of 7.5 m/s for 24 hours
 - c) Compare answers (a) and (b) and explain the difference



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TEST - 2

Even Semester: 2018-19

Course Code: EEE 318

Course Name: Distributed generation and Micro-grid

Program & Sem: B.Tech & VIII Sem (DE) Group-I

Date: 16 April 2019

Time: 1 hour

Max Marks: 40

Weightage: 20%

Instructions:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **both** the Questions. **Each** question carries **four** marks. (2Qx4M=8)

1. List any four power quality disturbances and explain any one of them.
2. List any four advantages of ultra-capacitors over battery.

Part B

Answer **both** the Questions. **Each** question carries **six** marks. (2Qx6M=12)

3. Discuss the impact of micro-grid on market and how utilities must support them so as to encourage micro-grid participation in the power market.
4. Discuss any two issues of premium power in DG integration.

Part C

Answer **both** the Questions. **Each** question carries **ten** marks. (2Qx10M=20)

5. List five applications of ultra-capacitors in Grid systems and explain any two in detail
6. Write short notes on different islanding scenarios when a) separation is mandatory b) separation is not mandatory c) Re-synchronization



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END TERM FINAL EXAMINATION

Even Semester: 2018-19

Date: 23 May 2019

Course Code: EEE 318

Time: 3 Hours

Course Name: Distributed Generation And Mico-Grid (DE)

Max Marks: 80

Program & Sem: B.Tech & VIII Sem(Group-I)

Weightage: 40%

Instructions:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **one** mark.

(20Qx1M=20M)

1.
 - i. NEC stands for
 - a) National electric code
 - b) Nation electric code
 - c) National electrical code
 - d) Nation electrical code
 - ii. The two types of float chargers are _____ and _____ respectively.
 - iii. Pulse width modulation is a process in which signal is converted to a series of pulses widths that vary inversely to the signal amplitude. (True/False)
 - iv. PLL stands for
 - a) Phase lock loop
 - b) Phase locked loop
 - c) Phase loop lock
 - d) Phase loop locked
 - v. As per article 450 of the NEC, overcurrent protection for transformer can be set as high as _____ of the transformer rating.
 - vi. Phase controlled rectifiers when operated with firing angle greater than 90 degrees, they are called
 - a) forced commutated inverter
 - b) load commutated inverter
 - c) line commutated inverter
 - d) none of these
 - vii. SCADA stands for
 - a) Supervision control and data acquiring
 - b) Supervision control and data acquisition
 - c) Supervisory control and data acquisition
 - d) Supervision control and data acquisitory
 - viii. Voltage sags and swells lasting for more than _____ minutes are classified as under voltage and over voltage.
 - ix. Which of the following charging methods is used to counter the self-discharge of the battery?
 - a) Bulk charging
 - b) Trickle charging
 - c) Taper charging
 - d) None of these
 - x. Power generated by a fuel cell depends on the temperature at which it operates.(True/False)

- xi. An MPPT charge controller operates using an algorithm called?
 - a) Observe and perturb algorithm
 - b) Perturb and observe algorithm
 - c) Observation and perturbation algorithm
 - d) Perturbation and Observation algorithm
- xii. Which of the following is not a source of distributed power generation?
 - a) Wind power
 - b) Natural gas
 - c) Solar power
 - d) Nuclear power
- xiii. Distributed generation (or DG) generally refers to small-scale (typically 1 kW – 50 MW) electric power generators. (True/False)
- xiv. Solar power is expressed in terms of?
 - a) kW/m³
 - b) kW/m²
 - c) kJ/m³
 - d) kJ/m²
- xv. Which of the following is not one of the factors affecting the performance of the solar power plant?
 - a) Incident Solar Radiation
 - b) Number of Cover Plate
 - c) Outlet Temperature
 - d) Dust on cover Plate
- xvi. The full form of DFIG is _____
- xvii. The power conditioning unit performs several functions such as control, regulation, conditioning, _____, automation, etc
- xviii. Waste treatment process that involves the combustion of organic substances contained in waste materials is called _____
- xix. The full forms of SOC and DoD are _____ and _____ respectively.
- xx. In single phase full bridge inverter the shape of the current waveform in case of pure inductive load is _____.

Part B

Answer **all** the Questions. **Each** question carries **ten** marks. (3Qx10M=30M)

2. a) Define round trip energy efficiency
 - b) For a typical battery of capacity C with an average discharge voltage of 1.2 V, average charge voltage of 1.45 V and C/D ratio of 1.1, Calculate the round trip percentage energy efficiency.
3. Discuss spurious separations and separation of exporting micro-grids in the context of islanding scenarios.
4. With the help of neat block diagram explain the operation of MPPT charge controller.

Part C

Answer **all** the Questions. **Each** question carries **ten** marks. (3Qx10M=30M)

5. Write short notes on PLL
6. Write short notes on DFIG modelling
7. Draw the circuit diagram and waveform of single phase full bridge inverter with R load and RL load