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M.TECH

Total Number of Pages : 1

M.TECH 1ST SEMESTER SUPPLE EXAMINATIONS, DECEMBER 2018

SMART ELECTRICAL ENERGY SYSTEM

Branch: PE, Subject Code:MPEPC1010

(Regulations 2017)

Time: 3 Hours

Max Marks : 70

Question Code: SD18002002

PART-A (10 X 2=20 Marks)

1. Answer the following questions.

- What is Distributed Generation? State the principle of DG power plant?
- What are the objectives of Smart Grid?
- A generating station has connected load of 450 MW and a maximum demand of 250 MW, units generated being 615×10^6 per annum. Calculate the demand factor and load factor.
- What are the types of converters used for wind energy systems..
- What will be the power generation in a 100kw wind turbine?
- Draw the layout of wind mill connected to grid.
- Define collector efficiency.
- Determine the available power output from wind turbine when Blade length= 52m, wind speed=12m/s, air density= 1.23 kg.m^3 and power coefficient is 0.4.
- Draw the power-speed and torque-speed characteristics of wind turbines.
- Define Base Load, Peak Load and Peak Shaving.

PART-B (5 X 10=50 Marks)

Answer any five questions from the following.

- Estimate the monthly average daily global radiation on a horizontal surface at Vadodara ($22^{\circ}00'N, 73^{\circ}10'E$) during the month of March if the average sunshine hours per day is 10. $A=0.28$ and $b=0.48$ for Vadodara. [5]
 - Explain how Smart Appliances can be the part of Smart Grid. [5]
- Draw and explain the block diagram of Static VAR generator employing an inverter. [5]
 - Explain the fixed speed system of wind system with Squirrel Cage Induction generator. [5]
- What is grid interfacing and how can the grid connection be made possible [5]
 - Explain how Smart Meters can play an important role to make a system Smart. [5]
- explain the Technical and economic impacts of Distributed Generation. [5]
 - A generating station supplied the following loads: 150 MW, 120 MW, 85 MW, 60 MW, and 5 MW. The station has a maximum demand of 220 MW. The annual load factor of the station is 48%. Calculate: 1) the number of units supplied annually 2) diversity factor [5]
- Distinguish about Constant speed constant frequencies WTG unit. [5]
 - A HAWT has the following data: [5]
Speed of wind = 10 m/s at 1 atm and $15^{\circ}C$
Diameter of rotor = 120 m
Speed of rotor = 40 rpm
Calculate the maximum possible torque produced at the shaft ..
- Explain the Semi Variable speed operation of Grid connected Wind energy system [5]
 - State and Explain the Double output system with VSI [5]
- Write Short notes on the following [5]
 - Solar Pond [5]
 - Current status and future trends of Distributed Generation [5]



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