



# COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)  
SHIVAJI NAGAR, PUNE - 411 005

## END Semester Examination

### EE-14001 Wind and Solar Power TH

Course: B.Tech

Branch: Electrical Engineering

Semester: Sem VII

Year: 2014-2015

Max.Marks:60

Duration: 3 Hours Time:- 2pm-5pm

Date:26/11/2014

#### Instructions:

MIS No.

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1. Solve any THREE questions from Q1 to Q5. Each question carries 20 marks.
2. Mobile phones and programmable calculators are strictly prohibited.
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of anything like stationery, calculator is not allowed.
5. Assume suitable data if necessary.
6. Write your MIS Number on Question Paper

Q.1.a) Explain the development of Wind Power with statistics globally and nationally.

Q.1.b) Explain the Stall and Pitch Control related to wind turbines with neat figures.

Q.2.a) What is meant by Tip-speed ratio? What are the disadvantages if it is not properly designed?

Q.2.b) Explain the Betz theorem.

Suggest the blade radius of a three blade wind turbine where the height of tower can be assumed to be 50 m from the ground. At 50 m assume wind speed to be 15 m/s average. Also it is intended to generate 5 kW of power from the system. Assume suitable data.

Q.3.a) What are the requirements for wind power plant in transmission network? Explain the impact of Wind Power on Power Quality.

Q.3.b) Explain solar radiation on tilted surfaces with the mathematical equations related to different parameters involved.

Q.4.a) What is the effect of earth sun angle on Solar Power Generation?

Q.4.b) Calculate the number of daylight hours (day length) at Pune on 21 June and 21 December in a leap year. The latitude of Pune is  $17^\circ$ .

Q.5.a) Give the classification of solar panels and Compare them and which one is more efficient and preferred?

Q.5.b) What is Maximum Power Point Tracking (MPPT)? Describe typical MPPT System. Discuss different methods for MPPT algorithms.