**Homework – 1**

1. Plot the Power density as a function of Wind Speed. The speed, U varies from 0 m/s to 30 m/s.
2. Plot the Power as a function of rotor diameter for U = 10, 20, 30 m/s. The diameter varies from 10 m to 50 m
3. Estimate the annual energy production from a horizontal axis wind turbine with 12 m diameter operating with average wind speed of 8 m/s. Assume standard atmosphere and a turbine efficiency of 40%
4. A 30 m diameter wind turbine is placed on a 50 m tower in terrain with a power law coefficient of 0.2. Find the ratio of available power in the wind at the highest point the rotor reaches to that at its lowest point.
5. Design a wind turbine rotor that will generate 100 kW of power in a steady wind of 7.5 m/s. Assume standard atmosphere, CP = 16/27 and 𝜂 = 1.