Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: **Wind Energy Technology** **Semester: VII**

Programme: Int.B.Tech (ET) + LLB (IPR)

Time: 03 hrs. **Max. Marks: 100**

Instructions: Clearly mention any assumptions with proper justification

SECTION A

S. No.		Marks	CO
Q 1	Explain the role & responsibilities of NIWE.	**4 M**	**CO1**
Q.2	Obtain the expression for Energy in the wind.	**4 M**	**CO1**
Q.3	Explain Betz's Constant and its importance	**4 M**	**CO2**
Q.4	Explain the characteristics of Induction generator	**4 M**	**CO4**
Q.5	If drag coefficient is 0.41, drive train coefficient is 0.91 and generator efficiency is 0.95, then calculate the 'Overall Power Coefficient' of Wind turbine.	**4 M**	**CO3**
	SECTION B		
Q.6	With neat diagram explain 'Blade profile' of Wind turbine with associated terms.	**8 M**	**CO2**
Q.7	Explain the overall construction of Wind Power Plant	**8 M**	**CO3**
Q.8	Explain the term Pitch and its effect of wind turbine performance.	**8 M**	**CO4**
Q.9	Estimate the rotor diameter for a wind power plant to generate 500 kW, at a wind speed of 22 kM/hr. Consider air density as 1.25 kg/m^3 & power coefficient as 0.37.	**8 M**	**CO3**
Q.10	Explain graphical method to estimate 'Wind resources assessment'	**8 M**	**CO5**
	SECTION-C		
Q.11	With neat diagram explain following parts of Wind Power plant: 1) Control Box 2) Braking Mechanism 3) Nacelle 4) Hub	**20 M**	**CO3, CO4**
Q.12	Plot a graph of power developed Vs wind speed for a wind turbine with a rotor diameter of 35 meters. Assume suitable air density. Wind Speed : 5 km/Hr, 10 km/Hr, 15 km/Hr, 20 km/Hr, 25 km/Hr, 30 km/Hr,	**20 M**	**CO1, CO2**