Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2025

Course: BBA GES **Semester: IV**
Program: Wind Energy Resource Management **Time: 03 hrs.**
Course Code: OGET2005_3 **Max. Marks: 100**

Instructions:

SECTION A
10Qx2M=20Marks (Answer All Question)

S. No.		Marks	CO
Q 1	**Which of the following is the most important factor in selecting a site for wind power generation?** A. Soil fertility B. Population density C. Average wind speed D. Annual rainfall	**2**	**CO1**
Q 2	**Which of the following is not typically a method used in wind resource assessment?** A. Wind mapping B. Remote sensing (e.g., LiDAR, SoDAR) C. Ground-based meteorological masts D. Soil sampling	**2**	**CO1**
Q 3	**The Weibull distribution is used in wind energy studies to:** A. Estimate air density B. Measure turbulence C. Model wind speed frequency distribution D. Determine blade design	**2**	**CO1**
Q 4	**What is the typical duration for wind data collection at a proposed wind farm site before development?** A. 1–2 weeks B. 1–3 months C. 6–12 months D. 2–5 years	**2**	**CO1**
Q 5	**In India, the wind energy potential is highest in:** A. Himachal Pradesh B. Uttar Pradesh C. Tamil Nadu D. Bihar	**2**	**CO1**
			CO1

Q 6	**What is the value of the Betz Limit (as a percentage)?** A. 25% B. 33% C. 59.3% D. 78.5%	**2**	
Q 7	**In a horizontal-axis wind turbine, which component captures the kinetic energy of the wind?** A. Generator B. Tower C. Rotor blades D. Nacelle	**2**	**CO1**
Q 8	Green Energy Open Access is allowed for consumers with a contract demand or connected load of: A. 100 kW and above B. 1 MW and above C. 10 MW and above D. 50 kW and above	**2**	**CO1**
Q 9	**Which of the following is not a charge typically associated with Open Access transactions?** A. Wheeling charge B. Cross-subsidy surcharge C. Standby charge D. Goods and Services Tax (GST)	**2**	**CO1**
Q 10	**Which of the following renewable sources is most commonly used in Open Access energy generation in India?** A. Biomass B. Hydro C. Solar and Wind D. Geothermal	**2**	**CO1**
SECTION B **4Qx5M= 20 Marks**			
Q 1	Define Betz Limit, cut in speed, rated wind speed in wind energy segment	**5**	**CO2**
Q 2	What are the charges associated in the procurement of wind energy through Open Access model	**5**	**CO2**
Q 3	A wind turbine of capacity 2 MW is generating 4555 MWh of energy annually. Estimate the Capacity Utilization Factor of wind turbine	**5**	**CO2**
Q 4	What are the advantages and limitations of Solar Energy over Wind Energy	**5**	**CO2**

SECTION-C **(Attempt any three)** **3Qx10M=30 Marks**			
Q 1	Describe the steps involved in the Techno-commercial assessment of a Wind Energy Project	**10**	**CO3**
Q 2	Estimate Annual Energy generation from a Wind Power Plant having capacity of 50 MW and CUF of 30%	**10**	**CO3**
Q 3	Estimate the rated power capacity of a wind turbine considering; 1. Diameter of blade 50 meter 2. Rated wind speed 10 m/s 3. Betz Limit Cp 0.30	**10**	**CO3**
Q 4	Describe various energy sale models of wind energy projects	**10**	
SECTION-D ***(Attempt any two)*** **2Qx15M= 30 Marks**			
Q 1	Should India prioritize offshore wind over onshore wind development going forward? Present your perspective based on resource management, costs, and policy support.	**15**	**CO4**
Q 2	Do you think small-scale wind turbines are a viable solution for decentralized energy access compared to Solar? Why or why not?	**15**	**CO4**
Q 3	Identify and explain the major risk factors involved in wind energy project management. How can these risks be mitigated?	**15**	**CO4**