II

Total No. of Questions – [06]

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Paper Code	

May 2022 - ENDSEM EXAM

B. TECH. (MECHANICAL) (SEMESTER - II)

COURSE NAME: SOLAR AND WIND ENERGY

COURSE CODE: Course code: IOEUA40183E

(PATTERN 2018)

Time: [1Hr]

[Max. Marks: 30]

Instructions to candidates:

1) **Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Question No.	Question Description	Marks	CO mapped	Blooms Taxonomy Level
Q.1 a	a) Identify the difference between Wind Mill and Wind Turbine. Give at least one application of each.	4	5	III
Q.1 b	b) Differentiate clearly Horizontal and Vertical Axis Turbine w. r. to Output power, Starting, Efficiency, Cost, Wind Direction, Gear Box and Generator, Maintenance in tabulated form.	6	5	III
	OR			
Q2 a	a) Enumerate the site selection factors for Wind Turbine Installation/s.	4	4	II
Q2 b	b) Classification of Wind Turbines based on minimum six parameters.	6	4	III
Q.3 a	a) a) You made a homemade wind turbine that has 3 blades that are one meter long each. You live at sea level so the air density = 1.23 kg/m3. The wind is blowing at 12 meters per second. What is the theoretical power output of turbine?	4	5	III

Q.3 b	Distinguish the function of 1) Rotor, 2) Hub, 3) Gear Box, 4) Generator, 5) Brake 6) Nacelle, 7) Yaw Mechanism. 8) Tower with labelled diagram.	6	5	III
	OR			
Q.4 a	a) What is aerofoil shape of Turbine blade? Draw Schematic diagram showing angle of attack.	4	5	III
Q.4 b	Apply equation of Power available in Wind Energy. Explain design of rotor from Blade Length, Material, Shape, no. of blades etc. and Wind Velocity.	6	6	IV
Q.5 a	With labelled schematic diagram explain the any two types of generators used in Wind Turbines.	4	5	II
Q.5 b	What are the issues occur while integrating wind energy with power grids?	6	6	III
	OR			
Q.6 a	What is the basic comparison between HVDC and HVAC?	4	5	III
Q.6 b	Judge the function of Electrical Collectors? With schematic diagram explain three typical layouts of electrical collectors for wind farms.	6	6	III