Total No. of Questions: [06]

PRN No.	

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Paper Code	U482-263E(FSE)

May 2022 - ENDSEM EXAM

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

COURSE NAME: SOLAR AND WIND ENERGY

COURSE CODE: Course code: IOEUA40183E

(PATTERN 2018)

Time: [1 Hr] [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**

Q.1) a) Identify the difference between Wind Mill and Wind Turbine. Give at least one application of each. [4]

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]

OR

Q.2) a) Enumerate the site selection factors for Wind Turbine Installation/s. [4]

b) Classification of Wind Turbines based on minimum six parameters. [6]

Q.3) 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]

b) Distinguish the function of 1) Rotor, 2) Hub, 3) Gear Box, 4) Generator, 5) Brake 6) Nacelle, 7) Yaw Mechanism. 8) Tower by drawing labelled schematic diagram. [6]

Q.4) a) What is aerofoil shape of Turbine blade? Draw Schematic diagram showing angle of attack. [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]

Q.5) a) With labelled schematic diagram explain the any two types of generators used in Wind Turbines. [4]

b) What are the issues occur while integrating wind energy with power grids? [6]

OR

Q.6) a) What is the basic comparison between HVDC and HVAC? [4]

b) Judge the function of Electrical Collectors? With schematic diagram explain three typical layouts of electrical collectors for wind farms. [6]

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