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Question Paper Code: 98301

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

One credit

Electrical and Electronics Engineering

19UEE801 -WIND FARM DEVELOPMENT AND OPERATION

(Regulation 2019)

Duration: 1.30 hours

Maximum: 50 Marks

Answer ALL Questions

PART A - (15 x 2 = 30 Marks)

- Winds having following speed are suitable to operate wind turbines.
(a) 5 – 25m/s (b) 10 – 35m/s (c) 20 – 45m/s (d) 30 – 55m/s
- What is the kinetic energy of 1 cubic meter of air moving at the speed of 10 m/s? The density of air is 1.2 kg/m^3 .
(a) 12 J (b) 120 J (c) 60 J (d) 6 J
- The wind speed is measured using an instrument called
(a) Pyranometer (b) Manometer (c) Anemometer (d) Wind vane
- The power output per square kilometre of a wind farm consisting of turbines with rotor diameters D in a mean wind speed u_m depends approximately on
(a) $D^2 u_m^2$ (b) $D^3 u_m^3$ (c) u_m^3 (d) $D^3 u_m^2$
- A wind turbine designed for a tip-speed ratio $\lambda = 9$, is operating in a mean wind speed of 12 m s^{-1} . The turbine blades are 50 m long. Estimate the number of revolutions made by the turbine in 30 years taking the capacity factor as 30%.
(a) 10^8 (b) 3×10^7 (c) 3×10^8 (d) 3×10^9
- Turbines blades have _____ type cross section to extract energy from wind.
(a) Aerofoil (b) Elliptical (c) Rectangular (d) All of the above
- Which of these is NOT a part of a modern wind turbine?
(a) Compressor (b) Gear box (c) Nacelle (d) YAW Drive

