



**NAVVRACHANA
UNIVERSITY**
a UGC recognized University

School: School of Engineering and Technology
Program/s: Electrical & Electronics Engineering
Year: 4th **Semester:** 8th
Examination: End Semester Examination
Examination year: May - 2023

Course Code: BE401 **Course Name:** Renewable energy sources
Date: 17/05/2023
Time: 10 am to 12 pm

Total Marks: 40
Total Pages: 2

Instructions:

- Write each answer on a new page.
- Use of a calculator is permitted.

Que. A	<u>Attempt any Five.</u>	Marks	BTL	CO
Q.1	What are the ways by which geothermal power generation is possible? Explain with appropriate diagrams.	6	CO7, CO8	BT1, BT2, BT3.
Q.2	Derive the equation for yearly power generation from tidal power plant. Also show the energy & power output from double cycle system with required diagram.	6	CO9, CO10	BT1 .BT2, BT4, BT5
Q.3	What is Biogas? Give the classification of biomass resources and also list out the biogas plants. Explain any one in detail with diagram.	6	CO10, CO11	BT1 .BT2, BT3, BT4
Q.4	What is Thrust in a wind turbine rotor? Derive the equation of thrust and torque acting on the turbine rotor.	6	CO7, CO8	BT1 .BT2, BT3, BT4
Q.5	The following data are given for a horizontal-axis wind turbine: Speed of wind= 15m/s, air density=1.229 kg/m ³ , rotor diameter=100m Rotor speed= 50 rpm, power co-efficient=50%. Calculate (i) total power density in wind system (ii) maximum torque (iii) maximum thrust.	6	CO4, CO5	BT1 .BT2, BT4, BT5
Q.6	The undisturbed wind speed at a place is 14 m/sec ² . The wind speed at the turbine rotor and at exit is 80% & 50%, respectively, of the undisturbed wind. The rotor diameter is 10 m and air density is 1.229 kg/m ³ . Calculate (i) Power available in the undisturbed wind (ii) power developed by wind turbine(iii) power co-efficient.	6	CO10, CO11	BT1 .BT2, BT3, BT4

