



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:VI
Class:TY	Program:B.Tech
Branch Code:MEC	Pattern:2022
Name of Course:Renewable Energy Engineering	Course Code:MEC223014B
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains ____ page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Marks CO

Question No. 1

- 1a) Explain how a solar central tower (heliostat) power plant works with a simple diagram. Also mention why steam generation in the receiver is possible in Indian conditions. (6) CO1

Question No. 2

- 2a) A wind turbine generates 1500 W at a rated wind speed of 24 km/h, air pressure at sea level, and temperature 20°C. Find the new power output if the turbine runs at 1800 m altitude, temperature 10°C, air pressure 0.88 atm, and wind speed 30 km/h. Assume $C_p = 0.42$. (6) CO2

Question No. 3

- 3a) Explain an updraft gasifier with a neat diagram. Also write the chemical reactions that occur inside the gasifier. (8) CO3

OR

- 3b) Explain different biomass resources and biofuels. (8) CO3
- 3c) Explain a fixed-dome biogas plant with a clear diagram. Also list the factors that affect biogas plant performance. (8) CO3

OR

- 3d) Write a note on biodiesel and explain the environmental benefits of using biomass. (8) CO3

Question No. 4

- 4a) Explain the components of a tidal power plant. Also write its advantages and disadvantages. (8) CO4

OR

- 4b) Explain a flashed steam geothermal power plant with a neat diagram and list important geothermal resources. (8) CO4
- 4c) Describe a single-basin double-effect tidal plant with a neat diagram. (8) CO4

OR

- 4d) Describe the working principle of a wave energy plant, its design parameters, and factors affecting its performance. (8) CO4

Question No. 5

- 5a) What factors affect the efficiency and performance of fuel cells in real applications? (8) CO4

OR

- 5b) Describe at least three hydrogen storage methods with advantages and disadvantages. (8) CO4

- 5c) Explain the working of a fuel cell with a neat labelled diagram. (8) CO4

OR

- 5d) Explain different hydrogen production methods (conventional and renewable). (8) CO4

..... **End of question paper**.....