PAPER ID-310431

Roll No: | | | | | | | | | | | | |

BTECH
(SEM VII) THEORY EXAMINATION 2024-25
RENEWABLE ENERGY RESOURCES

TIME: 3 HRS **M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	CO	Level
a.	Differentiate between fossil and non-fossil fuels.	CO1	K1
b.	What materials are commonly used in the fabrication of solar cells?	CO1	K2
c.	What is photovoltaic cell?	CO2	K2
d.	What is solar radiation?	CO2	K1
e.	What are geothermal energy resources?	CO3	K1
f.	What are the key components of an MHD power plant?	CO3	K2
g.	What do you mean by electromagnetic energy?	CO4	K2
h.	What are the different types of wind turbine rotors?	CO4	K2
i.	What are the sources of biomass for energy production?	CO5	K2
j.	What are the potential benefits and drawbacks of OTEC systems?	CO5	K2

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 20**

a.	Analyze the role of renewable energy sources such as solar, wind, hydroelectric, and biomass in addressing environmental concerns.	CO1	K3
b.	What are the construction details and performance analysis techniques for liquid flat plate solar collectors?	CO2	K2
c.	What is Magneto-Hydrodynamics (MHD)? Describe the role of a working fluid in MHD power generation.	CO3	K2
d.	What are the key factors affecting the performance of thermoelectric devices? Explain in brief.	CO4	K2
e.	What are the advantages and disadvantages of tidal power plants?	CO5	K2

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Define renewable and non-renewable energy resources. What are the key differences between these two types of energy?	CO1	K2
b.	What are the key challenges in integrating solar power plants into the electrical grid? Explain in brief.	CO1	K2

4. Attempt any *one* part of the following: **10 x 1 = 10**

a.	List down the various types of collectors used in collecting solar energy and explain their working principle, advantages and disadvantages and their areas of application.	CO2	K2
b.	Why is thermal energy storage important in renewable energy systems, and what are the key methods of sensible heat storage using solids and liquids?	CO2	K2

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5. Attempt any *one* part of the following: 10 x 1 = 10

a.	Explain the working principle of a geothermal power plant with suitable sketch.	CO3	K3
b.	What factors influence the performance of a fuel cell? Explain in brief.	CO3	K2

6. Attempt any *one* part of the following: 10 x 1 = 10

a.	What are the various types of wind turbines? With the help of a neat sketch, explain the working principle of horizontal axis wind turbine.	CO4	K3
b.	Explain the Seebeck effect and its role in thermoelectric power generation.	CO4	K2

7. Attempt any *one* part of the following: 10 x 1 = 10

a.	Explain the various biomass conversion technologies used to convert biomass into energy.	CO5	K2
b.	Describe the working principle of an open-cycle OTEC system.	CO5	K3