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**BTECH
(SEM VII) THEORY EXAMINATION 2023-24
RENEWABLE ENERGY RESOURCES**

TIME: 3 HRS

M.MARKS: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

Q no.	Question	Marks
a.	Describe photovoltaic effect.	2
b.	Write down the properties of polycrystalline silicon cell.	2
c.	Calculate angle of declination for 7 th of May of a leap year.	2
d.	Define solar isolation and solar irradiance.	2
e.	Comment on solar radiation and its benefits. ✓	2
f.	Write the chemical reaction taking place in alkaline fuel cell	2
g.	What is Seebeck effect? ✓	2
h.	State Peltier Effect. ✓	2
i.	List two advantages of anaerobic digestion.	2
j.	Write the merits of tidal power generation.	2

SECTION B

2. Attempt any three of the following: 10 x 3 = 30

a ✓	Discuss the main features of various types of renewable energy and non-renewable energy sources.	10
b.	Describe central receiver tower. Explain the temperature range obtained with central receiver tower system.	10
c ✓	With the help of schematic diagram, explain the operation of closed cycle MHD generating system.	10
d ✓	Explain the factors taken for site selection in wind farms. What are the advantages of wind energy conversion system?	10
e ✓	Explain availability, conversion theory of biogas plant and energy conversion from biomass.	10

SECTION C

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

a.	Describe the main elements of a PV system by giving a suitable diagram. ✓	10
b ✓	Discuss in detail about solar thermal power plant and its methodological process with a suitable process flow diagram. ✓	10

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

a ✓	Classify different types of solar thermal collector and show the constructional details of a flat plate collector. What are its main advantages? ✓	10
b.	With the help of schematic diagram explain the working of solar pond based electric power plant with cooling towers. ✓	10

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

a ✓	Explain the working of geothermal power plants. Discuss the various technical developments. ✓	10
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b.	Explain the working of molten carbonate fuel cells using appropriate diagram and write various chemical reactions involved in this type of fuel cells.	10
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6. **Attempt any one part of the following:** **10 x 1 = 10**

a.	What is the principle of wind energy conversion? What methods are used to overcome the fluctuating power generation of wind mills?	10
b.	Discuss in detail about performance and limitations of thermoelectric power generator.	10

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

a.	Illustrate factors affecting generation of biogas. Write a short note on any type of Biogas plant.	10
b.	Explain the principle, working and efficiency of Ocean Thermal Energy Conversion (OTEC) power plant. What are the environmental effects of OTEC?	10

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