

**Course: B. Tech.**

**Branch : Mechanical Engineering**

**Semester : VI**

**Subject Code & Name: BTMEC605C Renewable Energy Sources**

**Max Marks: 60**

**Date:26/08/2022**

**Duration: 3.45 Hr.**

**Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

	(CO)	Marks
<b>Q. 1 Solve Any Two of the following.</b>		
A) Differential between Renewable Energy sources and non-Renewable Energy sources.	CO1	6
B) Explain in detail energy reserves in India	CO1	6
C) Explain nuclear fission and Fusion.	CO1	6
<b>Q.2 Solve Any Two of the following.</b>		
A) Define a) Declination angle b) Solar Azimuth angle c) Zenith angle.	CO2	6
B) Explain with neat sketch construction and working of pyranometer.	CO 2	6
C) Calculate angle made by beam radiation with normal to a flat plate collector on May 1 at 09. 00 h. The collector is located in New delhi ( $28^{\circ} 35'N$ , $77^{\circ} 12'E$ ). It is tilted at an angle of $36^{\circ}$ with the horizontal and is pointing due south, also calculate for 12.00 h (Local apparent time).	CO 2	6
<b>Q. 3 Solve Any Two of the following.</b>		
A) Explain the different types of concentration collectors with neat sketch.	CO 2	6
B) Explain testing of flat plate collector with neat sketch.	CO 2	6
C) Explain construction and selection criteria for flat plate collector.	CO 2	6
<b>Q.4 Solve Any Two of the following.</b>		
A) Give the different application of solar energy and explain with neat sketch solar space heating.	CO 3	6
B) Explain construction and working of Photo Voltaic cell.	CO 3	6
C) What is wind energy? Explain selection of site for wind turbine generation system.	CO 4	6
<b>Q. 5 Solve Any Two of the following.</b>		
A) What is biomass energy? Explain with neat sketch floating drum type Biogas plant.	CO 4	6
B) Explain with neat sketch 1) Geothermal field. 2) liquid dominated geothermal plant.	CO 4	6
C) What is OTEC system? Explain working of open cycle OTEC system.	CO 4	6

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