DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. **Branch : Electrical** **Semester : IV**

Subject Code & Name: BTEEPE405C Advanced Renewable Energy Sources

Max Marks: 60 **Date:27/08/2022** **Duration: 3.45 Hrs.**

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.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Discuss renewable and conventional forms of energy. Highlight their merits and demerits.	**(Understand)**	**6**
B)	Explain the construction and working of a hydrogen-oxygen fuel cell.	**(Understand)**	**6**
C)	Discuss and differentiate between 'Decentralized' and 'Dispersed Generations.	**(Understand)**	**6**
Q.2	**Solve Any Two of the following.**		
A)	Enlist different modes of wind power generation and explain standalone mode in brief.	**(Remember)**	**6**
B)	Draw wind power generation curve and explain the terms cut-in speed, rated speed and cut-out speed.	**(Remember)**	**6**
C)	A wind mill with multi blade rotors lifts 3.03 m^3/h of water through a head of 28 m when the wind speed is 3.3 m/s. Calculate the power coefficient for a rotor diameter of 4.5 m. Assume, transmission efficiency=0.95 and pump efficiency= 0.70, density of water is 996, density of air is 1.2 Kg / m^3.	**(Evaluate)**	**6**
Q. 3	**Solve Any Two of the following.**		
A)	Draw equivalent circuit of a solar cell and deduce the relation $V_{oc}=AKT/q.\ln[(I_{sc}/I_o) +1]$, where the symbols have their usual significance.	**(Remember)**	**6**
B)	Explain the current-voltage characteristics of solar cell. Also define the fill factor.	**(Understand)**	**6**
C)	Discuss the standalone type of PV system.	**(Understand)**	**6**

Q.4 Solve Any Two of the following.

A)	With a neat diagram, discuss the working of Deenbandhu biogas plant.	**(Understand)**	6
B)	Explain the following terms related to biochemical energy conversion (i) Gasification (ii) Pyrolysis (iii) Liquefaction	**(Remember)**	6
C)	With a neat diagram discuss the biomass gasifiers.	**(Understand)**	6

Q. 5 Solve Any Two of the following.

A)	Differentiate between Battery and Flywheel.	**(Understand)**	6
B)	Explain working of Lead Acid battery with a neat diagram.	**(Remember)**	6
C)	Explain superconducting magnetic storage system with a block diagram.	**(Remember)**	6

***** End *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular Summer Examination –2023

Course: B. Tech. **Branch : Electrical** **Semester :IV**

Subject Code & Name: BTEEPE405C Advance Renewable Energy Recourses

Max Marks: 60 **Date: 22-07-2023** **Duration: 3 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.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	State the types of energy sources. Also explain the advantages and disadvantages of renewable energy sources.	CO2	6
B)	Explain construction and working principle of proton exchange membrane fuel cell.	CO2	6
C)	What are the aspects of hydrogen as a fuel?	CO2	6
Q.2	**Solve Any Two of the following.**		
A)	With the help of neat block diagram explain wind energy conversion system.	CO2	6
B)	Explain types of vertical axis wind turbine with neat sketch.	CO2	6
C)	Explain the factors considered for appropriate site selection of wind farm.	CO2	6
Q. 3	**Solve Any Two of the following.**		
A)	Explain the electricity generation by photovoltaic effects in detail.	CO2	6
B)	Draw and explain I-V characteristics of solar PV cell. Also define fill factor.	CO2	6
C)	Explain equivalent circuit of solar PV cell with neat diagram. Also derive the equation, $V_{oc} = \frac{AKT}{q} \ln (I_L/I_S)$	CO2	6
Q.4	**Solve Any Two of the following.**		
A)	Explain different types of biomass conversion process.	CO2	6
B)	With the help of neat sketch, explain the classification of biogas plants.	CO2	6
C)	Explain in detail the small scale pyrolysis unit with the help of neat diagram.	CO2	6

Q. 5	**Solve Any Two of the following.**		
A)	Draw schematic diagram of lead acid cell and explain its working in detail.	CO1, CO2	**6**
B)	With the help of neat block diagram explain compressed air energy storage.	CO1, CO2	**6**
C)	Explain in detail thermal energy storage.	CO1, CO2	**6**
	***** End *****		