Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER–I(New course)• EXAMINATION – WINTER- 2015

Subject Code: 2712108 Date: 04/01/2016

Subject Name: HYDROGEN AND FUEL CELL TECHNOLOGY

Time:2:30 pm to 5:00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Describe physical and chemical properties of hydrogen which makes it a suitable candidate for the fuel of the future giving suitable justification.	**07**
	(b)	Discuss safety concerns involved with use of hydrogen as a fuel.	**07**
Q.2	**(a)**	Describe the process of hydrogen production from gasification of coal.	**07**
	(b)	Describe Steam reforming process for production of Hydrogen from methane.	**07**
		OR	
	(b)	Describe reverse fuel cell operation for production of Hydrogen.	**07**
Q.3	**(a)**	How Hydrogen can be used as fuel for Automobile sector?	**07**
	(b)	Compare various methods for transportation of hydrogen.	**07**
		OR	
Q.3	**(a)**	Why multi staging and intercooling processes are employed during compression of hydrogen.	**07**
	(b)	Compare various methods for storage of hydrogen.	**07**
Q.4	**(a)**	Describe electrochemistry and thermodynamics of Fuel Cell.	**07**
	(b)	Compare battery and fuel cell.	**07**
		OR	
Q.4	**(a)**	Compare working of Solid Oxide fuel cell and Molten Carbonate Fuel Cell.	**07**
	(b)	Compare working of Phosphoric Acid fuel cell and Direct Methanol fuel cell.	**07**
Q.5	**(a)**	What are the economic and environmental advantages of using fuel cell?	**07**
	(b)	Compare various configurations of Fuel Cell hybrid for passenger cars	**07**
		OR	
Q.5	**(a)**	Explain use of Fuel Cells for large scale power systems.	**07**
	(b)	Explain use of Fuel Cells for Space applications.	**07**