Enrolment No.

## **GUJARAT TECHNOLOGICAL UNIVERSITY**

ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016

Date: 27/05/2016 Subject Code: 2723913 **Subject Name: ALTERNATIVE FUELS FOR TRANSPORTATION** Time: 10:30 am to 01:00 pm Total Marks: 70 **Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. Discuss in detail about different characteristics of alternate fuels and their **Q.1** (a) 07 availability status in the current scenario. Explain one method of production of ethanol fuel. 07 **(b) Q.2** Discuss in detail about the current energy consumption scenario and GHG 07 (a) emission from transport sector. Explain what is gasohol and how is it produced? 07 **(b)** What is the chief problem with alcohol ó gasoline blends?  $\mathbf{OR}$ (b) What are the significant properties required to be considered in case of liquid 07 fuels used in automobiles? Q.3 Compare Ethanol and Methanol. How is Methanol produced? 07 (a) What are the properties of bio diesel that makes it suitable to be used as engine 07 (b) fuel? OR Q.3Enlist biodiesel formulation techniques. Explain any one in detail. (a) 07 (b) Enlist desirable properties in a vegetable oil as a fuel. Also state pros and cons 07 of vegetable oil. 0.4 List out the properties of LPG. What are the disadvantages of LPG as a fuel? 07 (a) **(b)** Enlist the properties of CNG and discuss its advantages over LPG as a fuel. 07 OR How do you store gaseous fuels for IC engines? What are the safety measures 0.4 07 (a) to be considered while using gaseous fuels in IC engines? Write the chemical equation for esterification of vegetable oil and explain **(b)** 07 esterification process. Discuss the availability and properties of the following fuels; (a) H2 **Q.5** (a) 07 Straight Vegetable Oil (c) LNG. **(b)** What are the methods of hydrogen production? 07 Explain the process of biomass gasification with related chemical equations. **Q.5** (a) 07 Evaluate the methods of storage of hydrogen. 07 (b) \*\*\*\*\*

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