

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**M. E. - SEMESTER – II • EXAMINATION – WINTER 2012**

**Subject code: 1721102****Date: 31-12-2012****Subject Name: Alternate Fuels and Energy****Time: 10.30 am – 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.

- Q.1** (a) Explain need for alternate fuels. **07**  
(b) Explain engine modifications required for using CNG as fuel. **07**
- Q.2** (a) Give merits and demerits of hydrogen as alternative fuel. **07**  
(b) Explain use of LPG as fuel in automobiles. **07**
- OR**
- (b) Write short note on solar energy based vehicles. **07**
- Q.3** (a) Explain performance and emission characteristics of CNG. **07**  
(b) Explain any one method for hydrogen production. **07**
- OR**
- Q.3** (a) Explain any one method for hydrogen storage. **07**  
(b) Discuss safety aspects for hydrogen as fuel for engine. **07**
- Q.4** (a) Write short note on ignition accelerators. **07**  
(b) Explain trans-esterification process for bio-fuel production. **07**
- OR**
- Q.4** (a) Write short note on Hydrogen energy based vehicles. **07**  
(b) Explain use of methanol and gasoline blends in I.C. engine. **07**
- Q.5** (a) Explain layout of Electrical vehicle with neat sketch. **07**  
(b) Give performance characteristics of I.C. engine using biogas as fuel. **07**
- OR**
- Q.5** (a) Give properties of alcohols and explain any one method of its production. **07**  
(b) Write short note on hybrid vehicles. **07**

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