

**FACULTY OF ENGINEERING****B.E. 4/4 (AE) II - Semester (Main) Examination, April / May 2014****Subject : Alternative Fuels and Energy System for Automobiles****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions of Part - A and answer any five questions from Part - B.****PART – A (25 Marks)**

- 1 Explain the properties of alternative fuels.
- 2 What are the advantages of ammonia fuels?
- 3 Draw a block diagram for solar powered vehicle.
- 4 Explain the production of methanol fuels.
- 5 What are the advantages and limitations of CNG?
- 6 Name the different types of batteries used in electrical vehicle.
- 7 Explain favourable properties of Biogas and Vegetable oil.
- 8 Define fuel cell.
- 9 List advantages and disadvantages of Hybrid vehicles.
- 10 Draw a layout of an electric vehicle.

**PART – B (50 Marks)**

- 11 Write a detailed account on need, availability, properties, merits and demerits of various alternative fuels. (10)
- 12 Explain the performance of alcohol fuel compared with petrol fuel. (10)
- 13 Explain the products of combustion of hydrogen gas and its performance and safety aspects in detail. (10)
- 14 Explain the production of LPG and CNG and discuss the economics of using them as alternative fuels in automobiles. (10)
- 15 Write a chemical equation for esterification of vegetable oil and explain the esterification process. (10)
- 16 What are the main advantages and limitations of fuel cell and solar cars? Explain the working of electronic control system. (10)
- 17 Write short notes on the following: (10)
  - (a) Merits and demerits of CNG and LPG
  - (b) Use of vegetable oils for engines
  - (c) Emission characteristics of diesel and gasoline blends

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