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Question Paper Code : 11119

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2014.

Eighth Semester

Automobile Engineering

080190050 — ALTERNATE FUELS AND ENERGY SYSTEMS

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Assume any missing data suitably.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the alternate fuels available for use in automobiles instead of petroleum fuels?
2. What are the significant properties required to be considered in case of liquid fuels for use in automobiles?
3. What are specific advantage of alcohol blends used in automobiles?
4. What is vapour lock and explain how it is affected in case alcohol is blended with gasoline?
5. What are the major constraints in using bio-gas as fuel in engines?
6. List the problems encountered during the handling of hydrogen.
7. What is esterification of vegetable oils and explain its significance.
8. Compare bio-diesel and diesel emissions.
9. List the major specifications of electric vehicles.
10. Discuss on the major problems faced in fuel cell vehicles.

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are properties required in alternate fuels for effectively replacing conventional fuels in automobile engines? (8)
- (ii) Discuss on the availability of LPG, CNG, Alcohols for continuous use in automoboiles. (8)

Or

- (b) (i) What are the advantages of liquid fuels over gaseous fuels? (8)
- (ii) Compare fuel cell vehicles with petroleum based vehicles. (8)
12. (a) (i) Compare and evaluate the performance characteristics of gasoline and gasoline-alcohol blended engines. (8)
- (ii) Evaluate the combustion characteristics of alcohol blends in CI engines. (8)

Or

- (b) (i) Enumerate the desirable properties of alcohol as engine fuel. (8)
- (ii) Explain the production process of methanol. (8)
13. (a) (i) Compare the properties of Natural gas, LPG and Bio-gas. (8)
- (ii) Explain the engine modifications required for using CNG in SI engine. (8)

Or

- (b) (i) Evaluate the various hydrogen storage methods and compare their effectiveness for use in automobiles. (8)
- (ii) Discuss on the suitability of using LPG as alternative fuel in SI engines in terms of BHP, brake thermal efficiency, specific fuel consumption etc. (8)
14. (a) (i) What are the basic properties of vegetable oil that are considered favourable for use in engines? (8)
- (ii) List the vegetable oils used in engines and describe the manufacture of one of them. (8)

Or

- (b) (i) Compare and evaluate the combustion characteristics of bio-diesel and diesel. (8)
- (ii) Describe the trans-esterification process of manufacturing bio-diesel. (8)

15. (a) (i) Explain the electronic control system used in electrical hybrid vehicles. (8)
- (ii) Draw a block diagram of solar powered vehicles and explain the functions of each system. (8)

Or

- (b) (i) Explain the different types of battery used in electrical vehicles and their relative advantages. (8)
- (ii) Explain the polarization occurring in different fuel cells and how do you overcome the same in fuel cell powered vehicles. (8)
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