

**AE16002-ALTERNATIVE FUELS AND ENERGY SYSTEMS**

(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions**PART A - (8 X 2 = 16 marks)**

1. Which of the following statements is not correct with respect to alcohols as alternate fuels in IC engines
  - (a) anti-knock characteristics of alcohol is poor
  - (b) alcohol contains about half the heat energy of gasoline/litre
  - (c) alcohol does not vaporize as easily as gasoline
  - (d) alcohols are corrosive in nature
2. Octane number of natural gas is
  - (a) 60–80
  - (b) 80–100
  - (c) >100
  - (d) <60
3. Gaseous fuel is most suited for IC engine since physical delay is almost
  - a) zero
  - b) more
  - c) less
  - d) none of the mentioned
4. Under which compound name does the liquid petroleum gas (LPG) are sold?
  - a) Urea
  - b) Ethylene
  - c) Benzoyl peroxide
  - d) Butane
5. Can one use solid fuels for IC engines? If so how?
6. Compare bio-diesel and diesel emissions.
7. Discuss the problems encountered during handling of hydrogen.
8. Outline the major constituent of Bio-gas that actively take part in combustion.

**PART B - (4 X16 = 64 marks)**

09. (a) Discuss in detail about the various suitable properties, which effectively (16) replaces the gasoline fuel by alcohol in SI engine.

**(OR)**

- (b) Evaluate the emission characteristics of an CI engine fueled with conventional diesel fuel and oxygenated additive blends. (16)
10. (a) Differentiate the performance of the gasoline and neat vegetable oil in SI engine. (16)

**(OR)**

- (b) (i) Select the desirable properties of vegetable oil used in CI engines. (8)  
(ii) Outline the types of vegetable oils and brief the procedure of extraction (8)
11. (a) Discuss the possibility of using LPG as an alternative fuel in SI engines. (16)

**(OR)**

- (b) Judge the feasibility of Biogas and Natural gas as a source of fuel in IC engines. (16)
12. (a) Evaluate the various hydrogen storage methods and compare their effectiveness for using in automobiles. (16)

**(OR)**

- (b) Discuss the suitability of using Hydrogen as an alternative fuel in automobile engines in terms of BHP, brake thermal efficiency, Specific fuel consumption. (16)