

CS/B.TECH(AUE)/SEM-8/AUE-821/2012

2012

ALTERNATIVE FUELS AND ENERGY SYSTEM

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives from the following :

10 × 1 = 10

- i) Gasohol is mixture of
 - a) 90% ethanol + 10% gasoline
 - b) 10% ethanol + 90% gasoline
 - c) 40% ethanol + 60% water
 - d) 90% methanol + 10% ethanol.
- ii) Stoichiometric air fuel ratio of a alcohol when compared to gasoline is
 - a) higher b) lower
 - c) equal d) none of these.
- iii) Anti-knock character of methanol compared to ethanol is
 - a) higher b) lower
 - c) same d) none of these.
- iv) Octane No. of LPG is about
 - a) 50 b) 70 – 80
 - c) 80 – 90 d) 105 – 115.
- v) Self ignition temp. of diesel compared with gasoline is

- a) higher b) lower
c) same d) none of these.
- vi) Calorific value of CNG compared to LPG is
a) higher b) lower
c) same d) none of these.
- vii) Viscosity of Raw Jatropha oil in centistokes unit is
a) 4.2 b) 14.2
c) 38 d) 3.8.
- viii) Fire point of bio-diesel is
a) 50°C b) 1050°C
c) 180°C d) 0°C.
- ix) For high octane No. of a fuel, Flame speed is
a) higher b) lower
c) same d) none of these.
- x) Steam reformation is a process of making
a) bio-diesel b) CNG
c) Hydrogen d) LPG.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What are the requirements of an ideal gasoline fuel ?
3. State the temperature ranges of various fuels we get from crude oil during refining.
4. Compare hydrogen and petrol as a SI engine fuel.
5. What are the advantages of CNG as a SI engine fuel ?
6. Write the basic features of solar cell.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Define the following properties of a fuel :

i) Fire point

ii) Calorific value

iii) Cloud point

iv) Aniline point. 8

b) Write the advantages and disadvantages of solar energy. 7

8. a) What is Bio-diesel ? 3

b) Compare the various properties of diesel, raw jatropha and bio-diesel. 6

c) What are the advantages and disadvantages of biodiesel ? 6

9. a) What are the various methods of hydrogen storage ? 3

b) Describe various methods of using hydrogen in IC engines. 5

c) Hydrogen is a dangerous as well as a safe fuel. Why ? 7

10. a) What are the differences between LPG & CNG ? 3

b) Write the advantages and disadvantages of LPG. 5

c) Compare the various properties of Methanol, Ethanol and Gasoline. 7

11. a) Discuss alcohol as an SI and a CI engine fuels. 7

b) Write the advantages and disadvantages of methanol and ethanol. 8