

CS/B.TECH/AUE/SEM-8/AUE-821/2013

2013

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 alternative for the following : $10 \times 1 = 10$
- i) Gasohol is a mixture of
 - a) 90% ethanol + 10% gasoline
 - b) 10% ethanol + 90% gasoline
 - c) 10% ethanol + 90% water
 - d) 90% ethanol + 10% benzene.
 - ii) Small amount of gasoline is often added to alcohol to
 - a) reduce the emission
 - b) increase the power output
 - c) increase the efficiency
 - d) improve the cold weather starting.
 - iii) Anti-knock characteristics of alcohol when compared to gasoline are
 - a) higher b) lower
 - c) equal d) none of these.
 - iv) Disadvantage of hydrogen as a fuel in IC engine is
 - a) storage is easy b) low NO_x emission
 - c) detonating tendency d) easy handling.
 - v) For high octane number of a fuel, flame speed is

- a) higher b) lower
c) equal d) none of these.
- vi) Steam reformation is a process of making
a) biodiesel b) CNG
c) LPG d) hydrogen.
- vii) Self ignition temperature of diesel compared with gasoline is
a) higher b) lower
c) equal d) none of these.
- viii) Calorific value of CNG compared to LPG is
a) higher b) lower
c) equal d) none of these.
- ix) Stoichiometric air-fuel ratio of an alcohol when compared to gasoline is
a) higher b) lower
c) equal d) none of these.
- x) Alcohol alone cannot be used in CI engine as
a) its self ignition temperature is high
b) its latent heat of vaporization is low
c) both (a) and (b)
d) none of these.

GROUP – B

(Short Answer Type Questions)

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

2. What are the differences between *P*-type and *N*-type semiconductors ?
3. Write the disadvantages of solar energy. Explain.
4. Write the advantages of fuel cell.
5. What are the advantages of CNG as an SI engine fuel ?

6. Compare LPG and Petrol as an SI engine fuel.

GROUP – C

(Long Answer Type Questions)

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

7. Write short notes on any *five* of the following : 5×3

a) Flash point

b) Calorific value

c) Cetane no.

d) Octane no.

e) Viscosity

f) Cloud point

g) Aniline point.

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

b) Hydrogen is a dangerous as well as a safe fuel. Discuss.

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c) Describe the various methods of using hydrogen in IC engine. 5

9. a) Describe how sunlight is converted into electricity in a solar cell. 5

b) Explain the working principle of solar pond. 5

c) Briefly describe a refrigeration system using solar thermal energy with a neat sketch. 5

10. a) What are the advantages and disadvantages of biodiesel ? 7

b) Write and explain the advantages and disadvantages of alcohol. 8

11. a) What are the differences between LPG and CNG ? 3

b) Compare the properties of ethanol and methanol with petrol and diesel. 6

c) Write the advantages and disadvantages of LPG. 6