

CS/B.Tech/Even/AUE/8th Sem/AUE-803A/2014

2014

## Alternative Fuels and Energy Systems

Time Alloted : 3 Hours

Full Marks : 70

*The figure 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 for the following:

10x1=10

- i) Which is the basic fuel for a fuel Cell?  
(a) hydrogen (b) methanol  
(c) electricity (d) gasoline
- ii) 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
- iii) Anti-knock characteristics of alcohol when compared to gasoline is  
a) higher b) lower  
c) equal d) none of these

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- iv) Steam reformation is a process of making  
a) biodiesel b) CNG  
c) LPG d) hydrogen
- v) Calorific value of CNG compared to LPG is  
a) higher b) lower  
c) equal d) none of these
- vi) 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
- vii) Stoichiometric air fuel ratio of an alcohol when compared to gasoline is  
a) higher b) lower  
c) equal d) none of these
- viii) For high octane number of a fuel, flame speed is  
a) higher b) lower  
c) equal d) none of these
- ix) Self ignition temperature of diesel compared with gasoline is  
a) higher b) lower  
c) equal d) none of these
- x) Bio gas consists mainly of  
(a) Methane and carbon dioxide  
(b) propane and butane  
(c) ethane and carbon dioxide  
(d) none of the above

**GROUP - B**

**( Short Answer Type Questions )**

Answer any *three* of the following.

3x5=15

2. Compare LPG and Petrol as an SI engine fuel.
3. What are the differences between P-type and N-type semiconductors?
4. What are the advantages of CNG as a SI engine fuel?
5. Compare vegetable oil and Bio-diesel as Automotive Fuel.
6. Write the disadvantages of Solar Energy.

**GROUP - C**

**( Long Answer Type Questions )**

Answer any *three* of the following.

3x15=45

7. (a) Explain the working principle of fuel Cell.  
(b) What is the difference between fuel Cell and Batteries?  
(c) Write down the application of fuel Cell and types of fuel Cell.  
[5+5+5]
8. (a) What is Bio-diesel?  
(b) Compare the various properties of Diesel, raw Jatropha and Bio-diesel.  
(c) What are the advantages and disadvantages of bio-diesel?  
[3+5+7]
9. (a) Discuss alcohol as a SI and CI engine fuels.  
(b) Compare the properties of gasoline, methanol and ethanol.  
[8+7]
10. a) Describe how sunlight is converted into electricity in a solar cell.  
b) Explain the working principle of solar pond.

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

[5+5+5]

11. a) What are the various methods of hydrogen storage?  
b) Hydrogen is a dangerous as well as a safe fuel. Why?  
c) Describe the various methods of using hydrogen in IC engine.  
[3+7+5]