

Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS / B.TECH (AUE) / SEM-8 / AUE-821 / 2011**

**2011**

**ALTERNATIVE FUELS & 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 for the following :  $10 \times 1 = 10$ 
  - 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 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 temperature 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) Relative density (air = 1) of LPG over CNG is
- a) higher                                        b) lower
- c) equal                                         d) difficult to predict.
- viii) Fire point of bio-diesel is
- a) 50°C                                         b) 1050°C
- c) 180°C                                        d) 0°C.
- ix) Auto ignition temperature of LPG compared with CNG is
- a) higher                                        b) lower
- c) same                                         d) none of these.
- x) Viscosity of raw Jatropha oil in centistokes unit is
- a) 4.2    b) 14.2
- c) 38    d) 3.8.



**GROUP – B**

**( Short Answer Type Questions )**

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

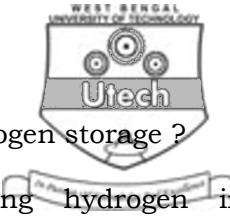
2. What are the requirements of an ideal gasoline fuel ?
3. Compare Hydrogen and Petrol as an SI engine fuel.
4. What are the advantages of fuel cell.
5. What are the differences between *P*-type and *N*-type semiconductor ?
6. What are the disadvantages of solar energy ?

**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.
- b) What are the advantages of solar energy ?  $8 + 7$
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 ?  $3 + 6 + 6$



9. a) What are the various methods of hydrogen storage ?  
b) Describe various methods of using hydrogen in IC engines.  
c) Hydrogen is a dangerous as well as a safe fuel. Why ?
10. a) What are the difference between LPG and CNG ?  
b) What are the advantages and disadvantages of LPG ?  
c) Compare the various properties of Methanol, Ethanol and Gasoline.
11. a) Describe how sunlight is converted into electricity in a solar cell.  
b) What are the advantages of using solar cell ?  
c) Discuss the various methods of hydrogen production.

3 + 5 + 7

3 + 5 + 7

6 + 3 + 6

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