



Name :

Roll No. :

Invigilator's Signature :

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

2013

ALTERNATIVE FUELS AND ENERGY SYSTEM

Time Allotted : 3 Hours

Full Marks : 70

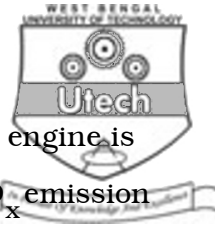
The figures in the margin indicate full marks.

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. 7
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 bio-diesel ? 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

=====