

**MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL**

Paper Code : AUE803A ALTERNATE FUELS AND ENERGY SYSTEMS

UPID : 008188

Time Allotted : 3 Hours

Full Marks : 70

*The Figures in the margin indicate full marks.**Candidate are required to give their answers in their own words as far as practicable***Group-A (Very Short Answer Type Question)**1. Answer *any ten* of the following :

[ 1 x 10 = 10 ]

- (I) What type of molecular structure has paraffin hydrocarbon?
- (II) What is the Octane number of natural gas?
- (III) What is the storage pressure of CNG?
- (IV) In CI engines knocking tendency increase with \_\_\_\_\_.
- (V) Blue smoke in CI engines indicate \_\_\_\_\_.
- (VI) Advantages of gaseous fuel is that \_\_\_\_\_.
- (VII) What is the calorific value of LPG?
- (VIII) Bio diesel is produced by the \_\_\_\_\_ of the vegetable oil.
- (IX) The first emission norms were introduced in India in \_\_\_\_\_ for diesel vehicles.
- (X) Which process is used to decompose the Hydrocarbons into smaller hydrocarbons?
- (XI) What is the major component of natural gas?
- (XII) How much Octane number iso-octane has?

**Group-B (Short Answer Type Question)**Answer *any three* of the following :

[ 5 x 3 = 15 ]

2. What is the reason behind the using of alternative fuels? [5]
3. Discuss about the chemical reaction of fuel in IC engine. [5]
4. Write down the composition and properties of LPG. [5]
5. Write down the working principle of fuel cell? [5]
6. Write a short note on vegetable oil as alternative fuel. [5]

**Group-C (Long Answer Type Question)**Answer *any three* of the following :

[ 15 x 3 = 45 ]

7. Classify the various types of fuel cells and explain them. [ 5+5+5 ]  
Write down the advantages and disadvantages of Fuel Cell.
8. What is the effect of high sulphur content on the performance of SI engines? [ 7+8 ]  
Briefly explain the petroleum refining process.
9. Explain the reasons for looking for alternative fuels for IC engines. [ 10+5 ]  
Can one use solid fuels for IC engines? Explain it.
10. Explain the emission effects on health and the environment. [ 10+5 ]  
Compare the Euro Standards and Bharat Standards as Emission norms.
11. What are the advantages and disadvantages of using LPG as alternative fuel? [ 5+5+5 ]  
Compare LPG and petrol as SI engine fuel.

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