

CS/B.Tech/AUE/Even/Sem-8th/AUE-803A/2015



WEST BENGAL UNIVERSITY OF TECHNOLOGY

AUE-803A

ALTERNATE FUELS AND ENERGY SYSTEMS

Time Allotted: 3 Hours

Full Marks: 70

The questions are of equal value.

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. Answer *all* questions. 10 × 1 = 10
- (i) Methanol by itself is not a good CI engine fuel because
(A) its octane no. is high (B) its octane no. is low
(C) both (A) and (B) (D) none of these
- (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 methanol compared to ethanol is
(A) higher (B) lower
(C) equal (D) none of these

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- (iv) Auto ignition temperature of LPG compared with CNG is
(A) higher (B) lower
(C) same (D) none of these
- (v) Calorific value of CNG compared to LPG is
(A) higher (B) lower
(C) equal (D) none of these
- (vi) Calorific value of raw Jatropha oil is (in MJ/kg)
(A) 43 (B) 51
(C) 38 (D) 29
- (vii) Which one is not a component of CNG conversion kit
(A) pressure regulator (B) gas air mixer
(C) on-off valve (D) evaporator
- (viii) Biomass fuels suffer from the disadvantage of
(A) low energy content (B) high sulfur
(C) both (A) and (B) (D) higher energy content
- (ix) Octane number of natural gas is about
(A) 60–80 (B) 80–100
(C) more than 100 (D) less than 60
- (x) Fire point of Bio-diesel is
(A) 50°C (B) 1050°C
(C) 180°C (D) none of these

GROUP B

(Short Answer Type Questions)

Answer any *three* questions.

2. Compare hydrogen and Petrol as an SI engine fuel.
3. Write the advantages of solar energy.
4. What are the advantages of hydrogen as fuel?
5. Write the advantages of fuel cell.

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6. Compare vegetable oil and bio-diesel as fuel.

GROUP C
(Long Answer Type Questions)

Answer any *three* questions.

3 × 15 = 45

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| 7. (a) What is biodiesel? | 3 |
| (b) Compare the various properties of diesel, raw Jatropha oil and biodiesel. | 5 |
| (c) Write the advantages and disadvantages of biodiesel. | 7 |
| 8. (a) What are the various methods of hydrogen storage. | 3 |
| (b) Describe various methods of using hydrogen in IC engines. | 5 |
| (c) Hydrogen is a dangerous as well as safe fuel, why? | 7 |
| 9. (a) Explain the reasons for looking for alternative fuels for IC engines. | 6+9 |
| (b) Explain the working principle of solar pond. | |
| 10. Write short notes on any <i>three</i> of the following: | 3 × 5 |
| (a) Cetane No. | |
| (b) Cloud point | |
| (c) Flash point | |
| (d) Viscosity | |
| (e) Calorific value | |
| 11. (a) Describe how the sunlight is converted into electricity in a solar cell. | 6 |
| (b) Describe with neat sketch a solar thermal power plant and solar assisted refrigeration system. | 9 |

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