**Enrollment No: _____ Exam Seat No:_____**

# C.U.SHAH UNIVERSITY
## Winter Examination-2019

**Subject Name: Alternate Fuels and Engines**

**Subject Code: 4TE07AFE1** **Branch: B.Tech (Automobile)**

**Semester: 7** **Date : 15/11/2019** **Time : 10:30 To 01:30** **Marks : 70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

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**Q-1** **Attempt the following questions:** **(14)**

**a)** Hydrocarbons are decomposed into smaller hydrocarbons by
a) reforming b) refining c) cracking d) polymerization

**b)** The compression ratio of alcohol fuel lies between- a) 11:1 to 13:1 b) 7:1 to 9:1
c) 5:1 to 7:1 d) none of the mentioned

**c)** The following is the chemical formula for petrol
a) $C_7H_{16}$ b) $C_8H_{18}$ c) $C_9H_{20}$ d) $C_{10}H_{22}$

**d)** Gasohol is a mixture of
a) 90% ethanol + 10% gasoline b) 10% ethanol + 90% gasoline
c) 40% ethanol + 60% gasoline d) 50% ethanol + 50% gasoline

**e)** Small amount of gasoline is added to alcohol to
a) reduce the emission b) to increase the power output
c) to increase the efficiency d) to improve cold weather starting

**f)** For C.I. engines fuel most preferred are
a) aromatics b) olefins c) paraffins d) napthenes

**g)** The molecular structure of the straight-run gasoline is changed by
a) reforming b) refining c) cracking d) boiling

**h)** Which was the first commercial hybrid car?
a) Honda Civic Hybrid b) Toyota Prius c) Lexus RX 400h d) Nisaan Versa

**i)** What is true about the Wankel engine
a) It is a rotary external combustion engine b) It is more expensive
c) It has a longer operating cycle d) It has less time to complete the combustion

**j)** Major constituent of natural gas is
a) methane b) ethane c) butane d) propane

**k)** Advantage of hydrogen as an IC engine fuel
a) high volumetric efficiency b) no HC and CO emissions
c) low fuel cost d) none of the mentioned

**l)** Detonation in petrol engines can be suppressed or reduced by the addition of small quantity of
a) lead nitrate b) iso-octane c) n-heptane d) none of the mentioned

**m)** Kerosene is distilled at a) 30-65ºC b) 65-220ºC c) 220-350ºC d) 350-450ºC

**n)** Major disadvantage of LPG as fuel in automobiles is
a) reduction in life of engine b) less power compared to gasoline
c) all of the mentioned d) none of the mentioned

**Attempt any four questions from Q-2 to Q-8**

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|---|---|---|---|
| **Q-2** | | **Attempt all questions** | |
| | **a)** | Explain the necessity of alternative fuels? Discuss the barriers in implementing alternative fuels. | **(07)** |
| | **b)** | Write methods of production of hydrogen, storage and transportation of hydrogen. | **(07)** |
| **Q-3** | | **Attempt all questions** | |
| | **a)** | Explain the production process of ethanol. Write its advantages & disadvantages. | **(07)** |
| | **b)** | Define BTL also discuss the emission benefits of BTL. | **(07)** |
| **Q-4** | | **Attempt all questions** | |
| | **a)** | Explain production process of methanol and write its industrial applications. | **(07)** |
| | **b)** | Discuss worldwide trend used for Bio-diesel. | **(07)** |
| **Q-5** | | **Attempt all questions** | |
| | **a)** | Comparison between DME and DEE. | **(07)** |
| | **b)** | Explain performance of blending methanol with gasoline. | **(07)** |
| **Q-6** | | **Attempt all questions** | |
| | **a)** | Write the specific properties of LPG, CNG and Biogas. | **(07)** |
| | **b)** | Draw layout of solar powered vehicle and write its merits and demerits. | **(07)** |
| **Q-7** | | **Attempt all questions** | |
| | **a)** | Explain performance of blending ethanol with gasoline. | **(07)** |
| | **b)** | Differentiate between hybrid vehicle and electric vehicle. | **(07)** |
| **Q-8** | | **Attempt all questions** | |
| | **a)** | Classify types of alternative fuels and write about two fuels with examples. | **(07)** |
| | **b)** | Comparison between wankel engine and sterling engine. | **(07)** |