2106

Code No: 5221AR

R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech II Semester Examinations, August - 2017

ALTERNATIVE FUELS

(Thermal Engineering)

Time: 3hrs **Max.Marks:75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

5 × 5 Marks = 25

1.a) What are the availability and properties of alternative fuels? [5]
b) What is DEE and DME? Mention its formula. [5]
c) What are the safety aspects of an LPG used engine. [5]
d) Explain about esterification process. [5]
e) Explain function of electronic control system in an automobile. [5]

PART - B

5 × 10 Marks = 50

2. List the advantages and disadvantages of using following alternate fuels. [10]
a) Hydrogen
b) Bio-Gas
c) Methanol-gasoline Blends and
d) Bio diesel blends.

OR

3. Discuss in detail about different characteristics of alternate fuels and their availability status in the current scenario. [10]

4. Discuss in detail about different methods of methanol production with neat schematic diagrams. [10]

OR

5. Discuss about the usage of alcohols in IC engines specific to their performance and emission parameters. [10]

6. Explain in detail about the design modifications to be done to use CNG/LPG in existing SI and CI engines. Justify your points with reasons. [10]

OR

7. Compare the performance and emission characteristics of Hydrogen and Biogas fueled engines with conventional SI engine performance. [10]

8.a) With the help of a neat flow diagram explain the processes involved in the esterification process in detail.

b) State the reasons for the process of esterification. [5+5]

OR

9. Discuss about the performance and emission characteristics of different blends of Bio-diesel in detail with the help of neat graphs. [10]

10. Explain the polarization occurring in different fuel cells and how do you overcome the scheme in fuel cell powered vehicle [10]

OR

11. Discuss about the working of a hydrogen fuel cell, explaining about the reactions occurring in it. [10]

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