

Roll No.

3807

**B. Tech. 8th Semester (Mechanical Engg.)
Examination – May, 2023**

ALTERNATE FUELS AND ENERGY SYSTEMS

Paper : PEC-ME-424-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

1. Explain the following in brief : 6 × 2.5 = 15
- (a) What do you mean by power density batteries ?
 - (b) Enumerate some applications of natural gas.
 - (c) Mention various vegetable oils used for engines
 - (d) What are the disadvantages of using alcohols in IC engines ?
 - (e) Write down any four uses of blends.
 - (f) Discuss about LNG fuel.

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UNIT - I

2. (a) What are the properties required by alternate fuels to effectively replacing the conventional fuels in automobile engine? 8
- (b) Discuss in detail about different characteristics of alternate fuels and their availability status in the current scenario. 7
3. (a) List some prominent alternative fuels and classify them. 7
- (b) Explain the merits and demerits of the alternate fuels. 8

UNIT - II

4. (a) List out and explain the techniques available for reduction of viscosity of vegetables. 8
- (b) Explain the performance of alcohol as fuel and compare with petrol. 7
5. (a) What are the basic properties of vegetables oils that are considered favourable for use in engine? 7
- (b) Describe the trans-esterification process to make bio-diesel. 8

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UNIT - III

6. (a) Explain the engine modification required for using CNG in SI engines. 7
- (b) Explain the performance and emission characteristic of engine running on CNG. 8
7. (a) Discuss the aspects of hydrogen storage and handling. Also list out the safety aspects in hydrogen usage as a fuel in an engine. 8
- (b) Explain the process of alcohol generation. List the raw material used for alcohol. 7

UNIT - IV

8. Explain the advantages and disadvantage of solar powered vehicle. Draw the layout of solar powered vehicle. 15
9. (a) Explain the different types of battery used in electric vehicles and their relative advantages. 8
- (b) List the major specifications of electric vehicles. 7

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