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Reg. No. :

Name :

**Seventh Semester B.Tech. Degree Examination, October 2014
(2008 Scheme)**

Elective – III – 08.706.21 : ALTERNATE ENERGY SOURCES (MPU)

Time : 3 Hours

Max. Marks : 100

PART – A

1. Explain flex fuel vehicle. List advantages and disadvantages.
2. Differentiate between natural gas and producer gas.
3. List any two methods of hydrogen production.
4. List down applications of PV panels in automobiles.
5. What are the different types of batteries used in electric vehicles ? Compare.
6. State the various components of an electric vehicle.
7. State some of the applications of biogas as a single fuel.
8. What is the need for non-conventional energy sources ?
9. What are the various methods in which hydrogen is stored ?
10. Explain the performance of engine with vegetable oil. **(10×4=40 Marks)**



PART – B

Answer **one** question from **each** Module.

Module – I

11. a) Explain the combustion characteristics of alcohols in SI engines. **10**
- b) What is the importance of methanol as an automotive fuel ? Explain methods used for methanol production. **10**

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12. a) Explain various methods used for producing hydrogen gas. 10
- b) Briefly explain the modifications necessary in an SI engine to use hydrogen as fuel. 10

Module – II

13. Explain “transesterification” and detail about the method of producing bio-diesel from various vegetable oils. 20
14. a) What is a bio diesel blend ? What are the different blends used ? Compare the performance to diesel for CI engines. 10
- b) What is producer gas ? How is it used in CI and SI engines ? 10

Module – III

15. a) Explain the principle of photovoltaic conversion. 10
- b) Explain about the various methods of collection and storage of solar energy. 10
16. a) Explain the factors considered in the design of electric vehicles. What are its limitation and detail about their applicability ? 10
- b) Do a comparative study on the use of fuel and energy recharging in electric vehicles. 10