VIT

Final Assessment Test – April 2019

Course: MEE1012 – Alternative Fuels

Class NBR(s): 2678 / 2684

Time: Three Hours

Slot: B1+TB1

Max. Marks: 100

Answer any TEN Questions

(10 X 10 = 100 Marks)

1. Elaborate on the desirable properties of automotive fuels and make a comparison table for SI and CI engine fuels.

2. Analysis of coal used in a boiler is: C= 82 %; H=4.2 %; O = 4.8 % and rest is ash. When this coal was used in a boiler, analysis of flue gas was CO_2 = 10 %; CO = 1.5 %; O_2 = 8.0 %; N_2 = 80.5 %. Determine (i) the amount of excess air used per kg of coal burnt (ii) total mass of air supplied per kg of fuel burnt (iii) percentage of excess air supplied for combustion.

3. Discuss in detail, the different modifications required in an IC engine to operate with hydrogen fuelling.

4. With neat schematics, explain the following characteristics of a hydrogen fuelled SI engine

   a) TFC Vs BP
   b) Volumetric efficiency Vs BP
   c) HC emission Vs BP
   d) CO emission Vs BP
   e) NOx emission Vs BP

5. To achieve rural sustainable energy development and greenhouse gas mitigation, propose an alternative plant for an agricultural village. Explain the construction and working of your proposed plant.

6. With a neat diagram, explain the component layout of the LPG fuelled passenger car.

7. Correlate the properties of alcohol fuels to the performance and emission characteristics of SI engines.

8. Explain in detail, the transesterification process adopted to produce the biodiesel. Brief the influence of different process parameters on such production process.

9. Explicate the different processing routes and usage of biomass in indian context.

10. Explain the construction and working principle of a hydrogen fuel cell with its implications.

11. With neat sketches, explain the working of series and parallel hybrid vehicles with their relative merits and demerits.

12. Explain the following

    a) Why it is difficult to implement the use of alternative fuels in India?
    b) Limitation of electric vehicles
    c) Discuss Eco-friendly plastic fuels(EPF)

Possession of Mobile Phone in the exam hall even in switched off condition is a malpractice