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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fifth Semester, B.E. - Automobile Engineering

Semester End Examination; Feb. - 2021

Automotive Fuel and Combustion

Time: 3 hrs

Max. Marks: 100

Note: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.

ii) Missing data, if any may be suitably assumed and stated.

UNIT - I

- 1 a. What are the assumptions made in air standard cycle analysis? 6
- b. Compare Otto, diesel and dual cycles for;
- i) Same constant maximum pressure and same heat input 9
- ii) Same maximum pressure and temperature
- iii) Same maximum pressure and output
- c. In an engine working on ideal Otto cycle the temperature at the beginning and end of compression are 50°C and 373°C. Find the compression ratio and air standard efficiency of the engine. 5
2. Explain the following with suitable diagram:
- i) Wind power
- ii) Energy from Biomass 20
- iii) Bio fuels
- iv) Fuel cells

UNIT - II

- 3a. Briefly explain the structure of petroleum. 8
- b. List the important products of refining process. 4
- c. Define viscosity, calorific value, flash and fire points and thermal cracking. 8
- 4 a. How fuels are rated? 6
- b. What is HUCK? Explain briefly. 4
- c. With suitable diagram, explain petroleum refining process. 10

UNIT - III

- 5 a. What is combustion? What are general conditions necessary for combustion? 4
- b. With suitable diagram, explain the stages of combustion in CI engines. 10
- c. What are the factors are affecting the engine variables on flame propagation? 6
- 6 a. With neat sketch, explain the stages of combustion in CI engines. 10
- b. What is delay period? Explain briefly. 4
- c. What are the variables affecting the delay period? Explain few. 6

UNIT - IV

- 7 a. What is dual fuel engine? Where does this type of engine finds application? 4
b. With suitable diagram, explain the construction and working of dual fuel engine. 10
c. Explain the performance of dual-fuel engines. 6
- 8 a. What is multi-fuel engine? What are the ways of achieving multi-fuel operation? 6
b. Discuss the performance of multi-fuel engine on various fuels. 6
c. List the advantages and disadvantages of dual fuel engine over diesel engine. 8

UNIT - V

- 9 a. Discuss briefly about stratified charge and lean burn engine. 8
b. What are advantages and disadvantages of VCR engine? 6
c. What are the important methods of charge stratification? 6
10. Explain the following:
i) CFR engine
ii) HCCI engines 20
iii) Free pilton engine
iv) Multicycle engines

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