

# CBCS SCHEME

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18AU54

## Fifth Semester B.E. Degree Examination, June/July 2023 Automotive Fuels and Combustion

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Explain the following: (10 Marks)
- i) Tidal power
  - ii) Wind power.
- b. Describe the following refining process: (10 Marks)
- i) Fractional distillation
  - ii) Thermal cracking
  - iii) Polymerization
  - iv) Isomerization.

OR

- 2 a. Explain the chemical structure of petroleum with example. (10 Marks)
- b. Describe the following properties: (10 Marks)
- i) Annealing point
  - ii) Vapour pressure
  - iii) Calorific value
  - iv) Viscosity.

### Module-2

- 3 a. What do you mean by octane rating and cetane rating? Explain its importance. (10 Marks)
- b. Explain the advantages and disadvantages of LPG and hydrogen as a fuel. (10 Marks)

OR

- 4 a. Sketch and explain ORSAT apparatus for flue gas analysis. (10 Marks)
- b. With neat sketch, explain gas chromatograph. (10 Marks)

### Module-3

- 5 a. Explain the stages of combustion in SI engine, with P- $\theta$  diagram. (10 Marks)
- b. Describe the design principles of SI engine combustion chamber. (10 Marks)

OR

- 6 a. Write a note on following: (10 Marks)
- i) Vaporization of fuel droplets and spray formation.
  - ii) Air motion and swirl in diesel engine combustion chamber.
- b. What do you mean by diesel knock? Explain its effects. (10 Marks)

### Module-4

- 7 a. Explain Willian's line method and motoring test to find friction power. (10 Marks)
- b. Describe the measurement of air consumption by air box method. (10 Marks)

OR

- 8 a. Define the following engine parameters:
- i) Indicated Thermal Efficiency
  - ii) Volumetric efficiency
  - iii) Brake specific fuel consumption
  - iv) Air-fuel ratio
  - v) Compression ratio.
- b. What do you mean by heat balance sheet? Explain in detail.

(10 Marks)

(10 Marks)

**Module-5**

- 9 a. Describe the various factors affecting combustion in dual fuel engine. (10 Marks)
- b. Explain the supercharged Dual-Fuel engine. (10 Marks)

OR

- 10 a. Mention the advantages of Dual-Fuel engines. (10 Marks)
- b. Justify the need of modification of fuel system in multi fuel engine. (10 Marks)

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