CBCS SCHEME

USN

18AU54

Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024

Automotive Fuels and Combustion

Time: 3 hrs. Max. Marks: 100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. With a neat sketch explain the working principle of solar energy. **(10 Marks)**
b. Describe the working of fuel cells with relevant sketch. **(10 Marks)**

OR

2 a. Describe the fractional distillation of petroleum with suitable figure. **(10 Marks)**
b. Write short notes on :
i) Specific gravity
ii) Viscosity
iii) Calorific value
iv) Flash and fire point. **(10 Marks)**

Module-2

3 a. Discuss the various properties of fuels. **(06 Marks)**
b. Describe the rating of fuels. **(06 Marks)**
c. Explain the properties of air fuel mixture. **(08 Marks)**

OR

4 a. Describe the working of a gas chromatograph with suitable figure. **(10 Marks)**
b. Explain the combustion equation with suitable example. **(10 Marks)**

Module-3

5 a. Discuss the various effects of engine variables on detonation in SI engines. **(10 Marks)**
b. With a suitable figure describe the types of combustion chambers in SI engine. **(10 Marks)**

OR

6 a. With a suitable figure discuss the various stages of combustion in CI engines. **(10 Marks)**
b. Describe the various methods of controlling diesel knock. **(10 Marks)**

Module-4

7 a. With a relevant diagram describe the working of rope brake dynamometer. **(10 Marks)**
b. Describe the various performance parameters of an engine. **(10 Marks)**

OR

8 a. Discuss the frictional power measurement by Willian's line method with relevant sketch. **(10 Marks)**
b. The following observations were made during one hour test on a single cylinder 4-stroke oil engine. Bore = 300mm, stroke = 450mm, Mass of fuel used = 8.8kg, Calorific value = 41800kJ/kg, Average speed = 200rpm, Mean effective pressure = 5.8bar, Brake load = 1860N, Mass of cooling water circulated = 650kg, temperature rise = 22°C, diameter of brake drum = 1.22m. Calculate : i) Mechanical efficiency ii) Brake thermal efficiency iii) Draw the heat balance sheet. **(10 Marks)**

Module-5

9 a. Discuss the characteristics of multi-fuel engines. (10 Marks)
b. Describe the performance of multi-fuel engines. (10 Marks)

OR

10 a. Discuss the properties of dual fuel and multi-fuel engines (10 Marks)
b. Describe the performance of diesel fuel engines. (10 Marks)

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