CBCS SCHEME

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18AU54

Fifth Semester B.E. Degree Examination, June/July 2024
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. Differentiate between exhaustible and inexhaustible energy sources with example. **(10 Marks)**

b. Write a note on following : i) Geo – thermal power ii) Wind power. **(10 Marks)**

OR

2 a. With a block diagram, explain the petroleum refining process. **(10 Marks)**

b. Describe the structure of petroleum with example. **(10 Marks)**

Module-2

3 a. Explain the rating of S.I and C.I engine fuels. **(10 Marks)**

b. What are the properties of Good Air fuel mixture? Explain. **(10 Marks)**

OR

4 a. Explain the flue gas analysis by gas chromatography with a neat sketch. **(10 Marks)**

b. Find the stoichiometric A/F ratio for the combustion of the ethyl alcohol C_2H_6O in a petrol engine. Calculate the A/F ratio for a mixture strength of 80% and determine the wet and dry analysis by volume at exhaust gas. **(10 Marks)**

Module-3

5 a. With neat sketch, explain the Stages of combustion in S.I. engines. **(10 Marks)**

b. With neat sketch, explain Precombustion chamber. Give its advantages and disadvantages. **(10 Marks)**

OR

6 a. Explain briefly with a neat sketch, three phases of C.I. engine combustion. **(10 Marks)**

b. Explain Ignition lag in C.I. engines. Briefly explain the important factors on which the ignition lag depends. **(10 Marks)**

Module-4

7 a. Explain the measurement of brake power of an IC engine by,
i) Prony brake dynamometer ii) Rope brake dynamometer. **(10 Marks)**

b. The following observations were recorded in a test of one hour duration on a single cylinder oil engine working on four strokes. Bore = 300mm, Stroke = 450mm, Fuel used = 8.8kg, CV of fuel = 41800 kJ/kg, Average speed = 200RPM, MEP = 5.8 bar, brake friction load = 1860N, Diameter of brake wheel = 1.22m. Calculate :
i) Mechanical efficiency ii) Brake thermal efficiency ii) BSFC iv) BMEP. **(10 Marks)**

OR

8 a. During a test on a 4-stroke cycle oil engine the following data and results were obtained. MEP = 5.6bar, swept volume = 14 liters, speed = 6.6 RPS, load = 0.75kN, radius of brake drum = 0.7m, Fuel consumption = 0.002kg/s, Calorific value of fuel = 46000kJ/kg, Cooling water circulation = 0.15 kg/s, cooling water inlet temperature = 38°C, cooling water outlet temperature = 71°C. Determine :i) Brake power ii) Indicated power iii) Mechanical efficiency iv) Indicated thermal efficiency. **(10 Marks)**

b. Explain the following : i) Morse test ii) Willan's line method. **(10 Marks)**

Module-5

9 a. Discuss the working of a dual fuel engine. State its advantages and disadvantages. **(10 Marks)**

b. Discuss any four factors affecting combustion in dual fuel engine. **(10 Marks)**

OR

10 a. What are the modification required to use CNG as fuel in diesel engine. **(10 Marks)**

b. Outline the requirement of multi-fuel engine modification. **(10 Marks)**

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