

Code No: R1931241

R19

SET - 1

III B. Tech I Semester Supplementary Examinations, June/July-2022
FUELS AND COMBUSTION
(Automobile Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I

1. a) What are fuels? Explain detailed classification of fuels with examples. [8M]
b) What is meant by gasification? Discuss the classification of gasification processes. [7M]

(OR)

2. a) Explain the primary and secondary fuels with examples. [8M]
b) Explain in detail about the handling and storage methods adapted for Coal. [7M]

UNIT-II

3. a) Explain the fractional distillation process with a neat sketch. [8M]
b) Discuss briefly about the important petroleum products. [7M]

(OR)

4. a) Explain about the different ways of storage and handling of liquid fuels. [8M]
b) Discuss in detail about the classification of gaseous fuels and explain the salient features of natural gas. [7M]

UNIT-III

5. a) What is stoichiometry? Discuss in detail about combustion stoichiometry with an example. [7M]
b) Explain the flue gas analysis by Orsat's apparatus method. [8M]

(OR)

6. a) What are the factors affecting reaction rates? Discuss them in detail. [8M]
b) Explain hydrogen oxygen reactions in detail. [7M]

UNIT-IV

7. a) Explain the terms [8M]
(i) Heat of combustion and
(ii) Enthalpy of combustion
b) Define Calorific value of fuel? Explain about Higher and lower calorific values. Also explain how the heating value of fuel is determined? [7M]

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(OR)

8. a) Explain about (i) Adiabatic flame temperature (ii) Equilibrium constant [8M]
b) The analysis of a coal by mass is 82% C, 6% H, 6% ash, 2% O and 4% H₂O. Calculate the stoichiometric air-fuel ratio. The actual air supplied is 18 kg/kg fuel. Given that 80% of the carbon is completely burnt and all the hydrogen. Calculate the volumetric analysis of dry products. [7M]

UNIT-V

9. a) What is meant by burning velocity of fuels? Explain how the burning velocity is measured? [8M]
b) Discuss in detail about the factors affecting burning velocity. What is the most important single factor affecting flame speed? [7M]

(OR)

10. a) Explain the concept of velocity of flame propagation. [8M]
b) Discuss about the ignition limits and Limits of inflammability. [7M]

