

**B.Tech. - VIEP - MECHANICAL ENGINEERING
(BTMEVI)**

00613 Term-End Examination

June, 2018

BIMEE-023 : COMBUSTION ENGINEERING

Time : 3 hours

Maximum Marks : 70

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) With a neat sketch, explain the principle of flue gas analysis. 7
- (b) Explain the combustion process of fuels. Describe in brief the method of oxygen quantity calculation for complete combustion. 7
2. (a) With a neat sketch, explain the battery ignition system required for combustion. 7
- (b) Compare any two ignition systems. Discuss their merits and demerits. 7

3. (a) Distinguish between "Octane Number" and "Cetane Number". Discuss their significance in rating of fuels. 7
- (b) Explain the phenomenon of knocking in S.I. Engine. How can the tendency of knocking be minimized ? Discuss the factors which influence knocking. 7
4. (a) What are the properties of CNG ? Discuss the advantages and disadvantages of CNG over petrol and diesel as engine fuel. 7
- (b) How does flame speed affect combustion ? Explain the various factors that influence the flame speed. 7
5. (a) Discuss the considerations in the design of combustion chambers for C.I. engines. 7
- (b) What is auto-ignition ? "Auto-ignition is the cause of detonation". Justify the statement. 7
6. (a) What is Stoichiometric Air-fuel (A/F) ratio ? Calculate the stoichiometric air-fuel ratio of natural gas (CH_4). 7
- (b) Discuss the reasons for incomplete combustion. Name the major pollutants emitted from exhaust due to incomplete combustion. 7

7. Write short notes on any *two* of the following : 7+7

- (a) Fuel injection system for CI and SI engines
 - (b) Properties of fuel used in SI and CI engines
 - (c) Laminar and turbulent flames
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