

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

Term-End Examination

00083

December, 2016

BIMEE-023 : COMBUSTION ENGINEERING

Time : 3 hours

Maximum Marks : 70

Note : Answer any five questions. All questions carry equal marks. Use of scientific calculator is permitted.

1. (a) Explain briefly the following with regard to a fuel :
 - (i) Vapour lock characteristics
 - (ii) Crank-case dilution

- (b) Discuss the effect of the following engine variables on flame propagation in S.I. engines :
 - (i) Compression ratio
 - (ii) Fuel-air ratio
 - (iii) Turbulence
 - (iv) Engine load
 - (v) Engine speed

7+7

2. (a) Explain the phenomenon of auto-ignition. Explain how auto-ignition is responsible for knocking in S.I. engines.
- (b) "Compressed Natural Gas (CNG) is preferable in S.I. engines than C.I. engines." Justify the statement. 7+7
3. (a) Explain briefly the combustion phenomenon in C.I. engines.
- (b) What do you understand by the term "Ignition delay" ? List the factors which affect ignition delay in S.I. engines. 7+7
4. (a) What are the desirable properties of I.C. engine fuels ?
- (b) Describe briefly the basic methods of generating air swirl in C.I. engines' combustion chambers. 7+7
5. (a) What are the two major reasons for incomplete combustion ? Name the major pollutants which are emitted from the exhaust of C.I. engines due to incomplete combustion.
- (b) What are the advantages of liquid and gaseous fuels over solid fuels ? 7+7

6. (a) A six-cylinder, four-stroke petrol engine having a bore of 90 mm and a stroke of 100 mm has a compression ratio of 7.0. The relative efficiency with reference to indicated thermal efficiency is 55% when the indicated specific fuel consumption is 0.3 kg/kWh. Estimate the calorific value of the fuel and fuel consumption (in kg/hr), if i.m.e.p. is 8.5 bar and the speed of the engine is 2500 rpm.
- (b) A six-cylinder, four-stroke diesel engine develops 125 kW and 3000 rpm. Its brake specific fuel consumption is 0.20 kg/kWh. Calculate the quantity of the fuel to be injected per cycle per cylinder. Specific gravity of the fuel may be taken as 0.85. 7+7
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