

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Regular Examination January / February 2011

Subject code: 712104N

Subject Name: Combustion Engineering

Date: 03 /02 /2011

Time: 02.30 pm – 05.00 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Define combustion and discuss Ignition limits for S.I. engines. **07**
(b) With help of P- θ diagram explain stages of combustion in S.I. engines. **07**

- Q.2** (a) Discuss effect of engine variables on flame propagation. **07**
(b) Discuss abnormal combustion in S.I. engines. **07**

OR

- (b) Explain factors affecting combustion chamber design for I.C. engines. **07**

- Q.3** (a) A S.I. engine operating at 1200 RPM has bore 102 mm with spark plug offset by 6 mm from the centre. The spark plug is fired at 20° before T.D.C. It takes 6.5° of engine rotation for combustion to develop and get into flame propagation mode, where the average flame speed is 15.8 m/s. Calculate : -(i) Time of combustion process in second. (ii) Crank angle position at the end of combustion. **07**

- (b) Explain with help of P- θ diagram combustion in C.I. engine i.e. heterogeneous combustion. Discuss all stages of combustion. **07**

OR

- Q.3** (a) Factor affecting delay period. **07**
(b) Compare Diesel knock and detonation. **07**

- Q.4** (a) Explain effect of compression ratio on thermal efficiency and specific fuel consumption. **07**

- (b) What are primary considerations in design of combustion chamber for C.I. engines. **07**

OR

- Q.4** (a) Compare open combustion chamber with divided combustion chamber **07**
(b) A six cylinder four stroke Diesel engine develops 125 kW at 3000 RPM. Its brake specific fuel consumption is 200 gm/kWh. Calculate the quantity of fuel to be injected per cycle per cylinder, specific gravity of fuel may be taken as 0.83. **07**

- Q.5** (a) Discuss the variables affecting fuel atomization and penetration. **07**
(b) Discuss various methods used in combustion of pulverized coal. **07**

OR

- Q.5** (a) Explain fluidized bed combustion and state factors affecting bed height. **07**
(b) Discuss pollution due to combustion of coal in power plants. **07**
