Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –I Examination Feb. - 2012

Subject code: 712104N **Date: 21/02/2012**
Subject Name: Combustion Engineering
Time: 10.30 am – 01.00 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)**	Compare Otto and Diesel cycles for, (i) Same compression ratio and same heat input. (ii) For constant maximum pressure and same heat input. (iii) For same maximum pressure and temperature.	**07**
	(b)	Explain stages of combustion in C I Engine with p – θ diagram.	**07**
Q.2	**(a)**	Define the Equivalence ratio and the Relative air / fuel ratio. For Octane (C_8H_{18}), calculate the Equivalence ratio for 27% excess air.	**07**
	(b)	An Engine working on a Diesel cycle, the air fuel ratio is 28:1. The temperature of air at the beginning of the compression is 27°C; The compression ratio is 17:1. What is the ideal efficiency of the engine based on the air-standard cycle? The calorific value of the fuel is 42300 kJ/kg	**07**
		OR	
	(b)	A hydrocarbon fuel has the following composition of dry products of combustion by volume: CO_2 = 12%, CO = 0.5 %, O_2 = 4%, and the rest N_2. Determine the air fuel ratio, the per cent theoretical air and the % composition of fuel on mass basis.	**07**
Q.3	**(a)**	Compare the Knocking phenomena in S I and C I engines.	**07**
	(b)	Explain with neat sketch: L – Head type combustion chamber	**07**
		OR	
Q.3	**(a)**	Draw and describe the spray pattern when fuel is injected in to swirling air.	**07**
	(b)	Explain with neat sketch: 'M' type combustion chamber	**07**
Q.4	**(a)**	Explain the working of fuel Injector with neat sketch.	**07**
	(b)	Give classification of solid fuels.	**07**
		OR	
Q.4	**(a)**	Which are the general characteristics of I C Engine fuel?	**07**
	(b)	Enlist types of nozzle for fuel injection. Explain any three.	**07**
Q.5	**(a)**	Enlist measuring tools which can measure the exhaust gas of I C Engine. Explain any two.	**07**
	(b)	Explain stabilization of pulverized coal combustion.	**07**
		OR	
Q.5	**(a)**	Discuss the performance of pulverized coal during combustion.	**07**
	(b)	Discuss pollution due to combustion of coal in power plants.	**07**

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