Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER 2012

Subject code: 712104N **Date: 16-01-2013**

Subject Name: Combustion Engineering (Major Elective -I)

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)**	What do you mean by Pre-Ignition? Explain it in brief.	**07**
	(b)	Explain briefly Combustion Phenomenon in SI Engine with the help of P-ϴ diagram.	**07**
Q.2	**(a)**	List different types of Combustion Chambers used in SI engine and explain the Ricardo's turbulent head design Combustion Chamber with neat sketch.	**07**
	(b)	Explain the phenomenon of knocking in SI engine with neat sketch.	**07**
		OR	
	(b)	Describe the Pre-combustion chamber for C.I. Engine and Discuss its relative merits and demerits.	**07**
Q.3	**(a)**	With help of P-ϴ diagram, explain working of combustion phenomenon of C.I. Engine.	**07**
	(b)	Define Delay period and State the factors on which delay period depends in C.I. Engine	**07**
		OR	
Q.3	**(a)**	Phenomenon of Squish with Tumble and Quench area in S.I. Engine with neat sketch.	**07**
	(b)	Explain briefly diesel injected fuel spray characteristics with neat sketch.	**07**
Q.4	**(a)**	What do you mean by flame stability? Explain the principle of combustion of liquid fuels in open vessel with neat sketch.	**07**
	(b)	Explain the structure of premixed flame of a simple gas burner.	**07**
		OR	
Q.4	**(a)**	List different vaporizing oil burners and explain the working of pot- type burner.	**07**
Q.4	**(b)**	List general requirements for smooth and efficient combustion takes place in gas turbine.	**07**
Q.5	**(a)**	Cyclone Burner working with neat sketch.	**07**
	(b)	Write short note on Fluidized bed combustion (FBC)	**07**
		OR	
Q.5	**(a)**	Combustion generated pollution and its controlled- write short note	**07**
	(b)	Calculate the Stochiometric air-fuel ratio for combustion of a sample of dry anthracite of following composition by mass Carbon(C) = 88 % Hydrogen (H_2) = 4% Oxygen (O_2) = 3.5% Nitrogen (N_2) = 1% Sulphure (S_2) = 0.5 % Ash = 3 % If 30 % excess air is supplied determine: (1) Air fuel ratio (2) Wet and dry analysis of product of combustion by volume.	**07**

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