Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–V • EXAMINATION – SUMMER • 2014

Subject Code: X 51904 **Date: 02-06-2014**

Subject Name: Internal Combustion Engines

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)**	Draw and explain ideal and actual valve timing diagrams for 4 stroke SI engine.	**07**
	(b)	Explain different losses in actual cycle over fuel-air cycle of IC engine with suitable diagram.	**07**
Q.2	**(a)**	Explain following terms: 1. HUCR 2. Octane No. 3. Cetane No.	**07**
	(b)	Calculate the percentage change in efficiency of air standard Otto cycle having a compression ratio of 7, if specific heat at constant volume increases by 2 %.	**07**
		OR	
	(b)	Derive equation showing effect of variable specific on efficiency of C.I. engine.	**07**
Q.3	**(a)**	Enlist alternative fuels used in IC engine. Compare properties of LPG and CNG as an IC engine fuel.	**07**
	(b)	Explain about effect of pollution on human and plant life.	**07**
		OR	
Q.3	**(a)**	Explain about requirement of fuel-air mixture at different load and speed for S.I. Engine.	**07**
	(b)	Explain MPFI system for S.I. Engine.	**07**
Q.4	**(a)**	Write limitation of simple carburetor. Explain Complete carburetor with different circuit.	**07**
	(b)	Explain magneto ignition system for SI Engine.	**07**
		OR	
Q.4	**(a)**	Write requirement of ideal injection system. Explain Common rail fuel Injection System.	**07**
	(b)	What is function of fuel injector in IC Engine? Explain different type of fuel injector.	**07**
Q.5	**(a)**	Write objectives of supercharging. Enlist different types of supercharging in SI engine. What are the limitations of supercharging in SI engine?	**07**
	(b)	Explain states of combustion in SI engine with suitable diagram.	**07**
		OR	
Q.5	**(a)**	Classify type of combustion chambers for CI Engine. Explain any one of them with neat sketch.	**07**
	(b)	In a Morse test with four cylinder four stroke petrol engine, the following data were obtained for a particular setting and speed. Brake power with all cylinders working = 32.0 kW Brake power with no. 1 cylinder cut out = 21.6 kW Brake power with no. 2 cylinder cut out = 22.3 kW Brake power with no. 3 cylinder cut out = 22.5 kW Brake power with no. 4 cylinder cut out = 23.0 kW Estimate the indicated power of the engine and its mechanical efficiency.	**07**

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