Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC– SEMESTER V– • EXAMINATION – SUMMER - 2016

Subject Code: X51904 **Date:19/11/2016**

Subject Name: Internal Combustion Engines

Time:10:30 AM to 1:00 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 Valve timing diagram of high speed diesel engine.	**07**
	(b)	Explain with neat sketch Detonation in S. I. Engine. Also mention the Factor affecting the detonation.	**07**
Q.2	**(a)**	Define Bore, stroke, compression Ratio, clearance ratio and mean effective pressure. Explain Valve timing diagram for 4-stroke diesel engine.	**07**
	(b)	What do you mean by air standard cycle? List assumptions for air standard cycle and list causes of departure of actual diesel cycle from ideal.	**07**
		OR	
	(b)	Calculate the percentage change in efficiency of air standard Otto cycle having a compression ratio of 7 for the following cases , (i) The specific heat at constant increases by 2 % (ii) The specific heat at constant pressure increases by 2% assuming γ =to be invariant.	**07**
Q.3	**(a)**	Explain with neat sketch Combustion stages in C. I .Engine. Also define delay period for combustion of fuel in CI engine.	**07**
	(b)	A 4-cylinder, 4-stroke petrol engine having 6 cm bore and 9 cm stroke was tested at constant speed. The fuel supply was fixed to 0.13 kg/min and plugs of 4-cylinders were successively short-circuited without change of speed. The brake power measurements were as follows: (1) 16.25 kW with all cylinder working, (2) 11.55 kW with No.1st –cylinder cut-off, (3) 11.65 kW with No.2nd –cylinder cut-off, (4) 11.70 kW with No.3rd –cylinder cut-off (5) 11.50 kW with No.4th –cylinder cut-off. Find, (a) The Indicated Power of engine (b) Mechanical efficiency (c) Indicated thermal efficiency, if CV of fuel used is 42000 kJ/kg and (d) Find the relative efficiency on IP bases assuming clearance vol. =60 cm^3.	**07**
		OR	
Q.3	**(a)**	Give complete classification CI engine Combustion chamber with schematic diagram of each type.	**07**
	(b)	What are basic requirements of good spark ignition engine combustion chamber and general principles of spark ignition combustion chamber.	**07**
Q.4	**(a)**	Explain with neat sketch working Simple Carburetor. Also explain drawback and application of simple Carburetor.	**07**
	(b)	With neat sketch explain working principle and constructional detail of Bosch fuel injection pump.	**07**
		OR	
Q.4	**(a)**	What is Scavenging system? Gives its importance and enlist the types of it.	**07**
	(b)	Draw neat and labeled diagram of multi point fuel injection system for modern automobile engines and explain its working.	**07**
Q.5	**(a)**	Write brief note on Wankle Engine.	**07**
	(b)	Write brief notes on: Euro Norms and Testing of IC engine as per IS.	**07**
		OR	
Q.5	**(a)**	Describe a magneto ignition system with neat sketch and compare its advantages and disadvantages with battery ignition system.	**07**
	(b)	Describe with sketches the different methods of supercharging.	**07**

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