Seat No.:	Enrolment No

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI • EXAMINATION – SUMMER 2013

Subject Code: 161902 Date: 27-05-2013 **Subject Name: Internal Combustion Engines** 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. 4. Usual notations are used **Q.1** (a) What do you mean by I.C. Engine? How are they classified? 07 (b) Define Bore, stroke, compression Ratio, clearance ratio and mean effective pressure. 07 Explain Valve timing diagram for 4-stroke diesel engine. **Q.2** (a) Derive expressions for the efficiency and mean effective pressure of an Otto cycle. **07** Comment on the effect of compression ratio on the efficiency. In a SI engine working on the ideal Otto cycle, the compression ratio is 5.5. The 07 pressure and temperature at the beginning of compression are 1 bar and 27° C respectively. The peak pressure is 30 bar. Determine the pressure and temperatures at the salient points, the air-standard efficiency and the mean effective pressure. Assume ratio of specific heats to be 1.4 for air. (b) What is the basic difference between an Otto cycle and Diesel cycle? Derive an 07 expression for the efficiency and mean effective pressure of the Diesel cycle. Q.3 (a) Define pre-ignition with respect to SI engines and delay period with respect to a CI 07 (b) What is meant by abnormal combustion? Explain the phenomena of knock in SI 07 OR Q.3(a) How LPG can be used as an alternate fuel in a SI engine? Briefly explain the important details about the conversion kit, which is used to convert an existing petrol car in to a gas car running in LPG **(b)** What are the advantages of using alcohols as fuels in SI engines? **07 Q.4** (a) What are the factors affecting carburetion? 07 **(b)** Differentiate between multipoint injection and direct injection. **07** OR O.4 (a) What is Scavenging system? Gives its importance and enlist the types of it. 07 **Q.4** (b) Explain the types of nozzles used in CI engines. **07 Q.5** (a) Write down Bharat Stages of emission norms in brief for cars and two wheelers. 07 (b) What are the international accepted methods for measuring the NO_x, CO and HC? **07 Q.5** (a) What is supercharger? Explain turbo-supercharger. 07 **(b)** Explain the working principles of Stirling and Wankle engines in detail. **07**
