Enrolment No.

Date:09/05/2016

Total Marks: 70

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER-V. EXAMINATION – SUMMER 2016

Subject Code:X51904

Subject Name:Internal Combustion Engines

Time:02:30 PM to 05:00 PM

Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- Q.1 (a) Define Bore, stroke, compression Ratio, clearance ratio and mean effective 07 pressure. Explain Valve timing diagram for 4-stroke diesel engine.
 - (b) Discuss the difference between theoretical and actual valve timing diagrams of four stroke petrol engine.
- Q.2 (a) Explain "air standard analysis" which has been adopted for IC engine cycles. 07 State assumptions made for air standard cycles and air fuel cycles.
 - (b) In a SI engine working on the ideal Otto cycle, the compression ratio is 6. The pressure and temperature at the beginning of compression are 1 bar and 27°C respectively. The peak pressure is 30bar. Determine the air-standard efficiency and the mean effective pressure. Assume ratio of specific heats to be 1.4 for air.

OR

- (b) Find the percentage change in efficiency of an Otto cycle having compression 07 ratio of 9, if the Specific heat at constant volume decreases by 2 %.
- **Q.3** (a) What are desirable properties of I.C Engine Fuels?
 - (b) Explain the phenomenon of diesel knock. Compare it with the phenomenon of 07 detonation in SI engine.

OR

- Q.3 (a) What is the function of carburetor in an SI engine? Briefly explain with a neat 07 sketch the operation of simple float type carburetor.
 - (b) Describe with suitable sketches the following systems of carburetor.(i) Main metering system
 - (ii) Ideling system
 - (iii) Acceleration pump system
- Q.4 (a) What are the basic requirements of a good CI engine combustion chamber?
 (b) Describe different types of injection nozzles and discuss their relative 07 advantages and disadvantages.

OR

- Q.4 (a) Describe with sketches the different methods of supercharging.
 (b) What is Scavenging system? Gives its importance and enlist the types of it.
 Q.5 (a) Explain the Methods of obtaining friction power and explain any one of them in detail.
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 - (b) Explain the working of battery ignition system. State its advantages and 07 disadvantages over magneto ignition system.

OR

Q.5 (a) Write down Bharat Stages of emission norms in brief for cars and two wheelers. 07
 (b) Explain the working principles of Stirling and Wankle engines in detail. 07

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