

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: **07**
1. HUCR 2. Octane No. 3. Cetane No.
(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. **07**
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.
