

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – I • EXAMINATION – WINTER 2012****Subject code: 711102N****Date: 09-01-2013****Subject Name: Fundamentals of I.C.Engine and Automobile****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) The air-fuel ratio of a Diesel engine is 29:1. If the compression ratio is 16:1 and the temp. at the end of compression is 900 K, find at what cylinder volume the combustion is complete? Express this volume as a percentage of stroke. Assume that the combustion begins at the top dead centre and takes place at constant pressure. Take C.V. of the fuel as 42000 kJ/kg, $R=0.287$ kJ/kg K and $C_v= 0.709 + 0.000028 T$ kJ/kg K. **07**
- (b) State and explain the factors responsible for change in valve timing in actual cycle as compared to ideal cycle. **07**
- Q.2** (a) Explain different scavenging processes in two stroke engine with figure. **07**
- (b) Briefly explain a typical electronic engine management system. **07**
- OR**
- (b) Write short note on vibration damper. **07**
- Q.3** (a) Briefly discuss the air-fuel ratio requirement of a petrol engine from no load to full load. **07**
- (b) Explain Distributor type pump for CI engine. **07**
- OR**
- Q.3** (a) Explain various types of nozzles used in CI engine with figure. **07**
- (b) Explain various phases of spray formation from nozzle. **07**
- Q.4** (a) Explain working principle of synchromesh gear box. **07**
- (b) Draw typical layout of electrical system of an automobile & explain in brief. **07**
- OR**
- Q.4** (a) Explain construction and working of centrifugal clutch. **07**
- Q.4** (b) Explain working of stratified charged engine. **07**
- Q.5** (a) Explain the concept of multipoint fuel injection system. **07**
- (b) Explain use of combustion charts for cycle analysis. **07**
- OR**
- Q.5** (a) State and explain three basic types of carburetors. **07**
- (b) Explain the concept and working of cam less engine. **07**
