

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- Vth SEMESTER-EXAMINATION – MAY/JUNE - 2012****Subject code: 150201****Date: 05/06/2012****Subject Name: Automobile 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) Classify the internal combustion engine with respect to Cycle of operation, types of ignition, cylinder arrangements, types of fuel used, method of charging the cylinder and type of cooling. **07**
- (b) Define Scavenging and explain various methods of scavenging. **07**
- Q.2** (a) Describe the working of jerk type fuel feed pump for CI engine with neat sketch. **07**
- (b) Explain automotive engine's air-fuel requirements based on following demand. **07**
- (i) Idling (ii) cruising (iii) high power & acceleration.
- OR**
- (b) Discuss working and construction of Sterling engine with neat sketch. **07**
- Q.3** (a) A simple single jet carburetor is required to supply 5 kg of air and 0.5 kg of fuel per minute. The specific gravity is 0.75. The air is initially at 1 bar and 300 K. Calculate the throat diameter of the choke for a flow velocity of 100 m/s. Velocity coefficient is 0.8. If the pressure drop across the fuel metering orifice is 0.80 of that of the choke, calculate orifice diameter assuming coefficient of flow $C_{df} = 0.60$ and specific heat ratio $\gamma = 1.4$ for air. **07**
- (b) Define Highest useful compression ratio, Octane no, Cetane no and Diesel index. **07**
- OR**
- Q.3** (a) Classify the combustion chambers for CI engine and discuss the open combustion chambers with neat sketch. **07**
- (b) Explain phenomenon of knock in CI engine and compare it with SI engine knock. **07**
- Q.4** (a) Discuss how additives help to achieve desired properties for lubricants. **07**
- (b) Classify the cooling system and discuss Pressure cooling system with neat sketch. **07**
- OR**
- Q.4** (a) What is air cooling system? Why fins and baffles are required in an air cooled engine? **07**
- (b) What is meant by supercharging? Explain the working of supercharger. **07**
- Q.5** (a) A four stroke cycle gas engine has a bore of 20 cm and a stroke of 40 cm. The compression ratio is 6. In a test on the engine the indicated mean effective pressure is 5 bar, the air to gas ratio is 6:1 and the calorific value of the gas is 12 MJ/m^3 at NTP. At the beginning of the compression stroke the temperature is 77°C and pressure 0.98 bar. Neglecting residual gases, determine the indicated power, the thermal efficiency and the relative efficiency of the engine at 250 rpm. **07**
- (b) Describe Catalytic converter with neat sketch. **07**
- OR**
- Q.5** (a) Explain working and construction of Orsat apparatus. **07**
- (b) Classify engine emissions. Explain briefly various exhaust emission from engine. **07**
