

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– VIII (New) EXAMINATION – WINTER 2019****Subject Code: 2180215****Date: 25/11/2019****Subject Name: Automotive And Combustion Engine Technology****Time: 02:30 PM TO 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) Describe pollutants formed by combustion of gasoline in brief. **03**  
(b) Explain in brief advance technologies employed in gasoline engine to improve fuel economy. **04**  
(c) Define term Downsizing. Explain any one method of downsizing. **07**

- Q.2** (a) Explain the need of after cooler in case of exhaust gas recirculation (EGR). **03**  
(b) Explain in brief concept of EGR with schematic diagram. **04**  
(c) Explain turbocharged direct injection (TDI) with schematic diagram. **07**

**OR**

- (c) List out exhaust emission control techniques. Explain urea-based SCR NO<sub>x</sub> after treatment technique. **07**

- Q.3** (a) Define Ignition lag in brief. **03**  
(b) Explain gasoline auto ignition combustion through residual gas trapping approach. **04**  
(c) Describe combustion phenomenon of gasoline engine. **07**

**OR**

- Q.3** (a) What is internal exhaust gas recirculation system and external exhaust gas recirculation system? **03**  
(b) Explain different types of direct injection gasoline injectors. **04**  
(c) Explain wall guided and spray guided direct injection combustion system. **07**

- Q.4** (a) Explain in brief concept of lean boost combustion system. **03**  
(b) Explain operation of gasoline auto ignition combustion with thermal management. **04**  
(c) Describe problems and challenges associated with turbo-charging the SI engine. **07**

**OR**

- Q.4** (a) Write disadvantages of wall guided direction injection system. **03**  
(b) Explain operational limitation of HCCI combustion. **04**  
(c) Explain working principle of auto ignition combustion in gasoline engine. **07**

- Q.5** (a) Explain in brief influences of EGR on exhaust emission of turbo charged diesel engine. **03**

- (b) What is the need of a cam profile switching (CPS) mechanism and twin independent variable cam timing (VCT) device in SI and controlled auto ignition operation in a gasoline engine? **04**
- (c) Write a short note on homogeneous charge compression ignition (HCCI) diesel engine. **07**

**OR**

- Q.5** (a) Compare multi point fuel injection and gasoline direct injection system. **03**
- (b) Describe any one approach to HCCI operation in gasoline engines. **04**
- (c) Explain working of direct injection gasoline engine with neat sketch. **07**

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