

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER-VIII EXAMINATION- SUMMER 2019

Subject Code:2180215

Date:02/11/2020

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.

| | | MARKS |
|------------|--|-----------|
| Q.1 | (a) List the advantages of engine downsizing. | 03 |
| | (b) What are the types of nozzle are used in gasoline direct injection? | 04 |
| | (c) Explain the combustion phenomenon for gasoline engine. | 07 |
| Q.2 | (a) What is charge stratification combustion? | 03 |
| | (b) Explain supercharging of engine. | 04 |
| | (c) Explain the reasons of knocking in SI Engine. List various methods to reduce knocking. | 07 |
| OR | | |
| | (c) Explain salient feature of spray guided combustion system for gasoline direct injection | 07 |
| Q.3 | (a) Enlist various after treatment technologies for diesel and gasoline vehicle. | 03 |
| | (b) What is lean boost direct injection (LBDI) concept? Explain the working principle of LBDI | 04 |
| | (c) What are the advantages of combining direct injection and turbo charging in spark-ignition engine? | 07 |
| OR | | |
| Q.3 | (a) What is internal exhaust gas recirculation system and external exhaust gas recirculation system? | 03 |
| | (b) What is auto ignition phenomenon? What is the basic difference between auto ignition combustion and SI combustion? | 04 |
| | (c) Explain effect of different properties of gasoline on combustion phenomenon | 07 |
| Q.4 | (a) Explain factors which increase NO _x production in CI engine. | 03 |
| | (b) With a neat sketch explain the process of turbo charging? | 04 |
| | (c) Differentiate homogenous combustion and diffusion combustion based on any seven aspects. | 07 |
| OR | | |
| Q.4 | (a) Explain the principle of auto ignition combustion in the gasoline engine. | 03 |
| | (b) What is Turbo Lag in Turbocharging? | 04 |
| | (c) Explain the effect of fuel injection timing on auto ignition combustion. | 07 |
| Q.5 | (a) Give advantage of HCCI engine. | 03 |
| | (b) Which are the modifications required to change from SI combustion to auto ignition combustion? | 04 |
| | (c) Describe how the selective catalytic reduction (SCR) NO _x control as an alternative to lean NO _x traps (LNT) | 07 |
| OR | | |
| Q.5 | (a) What is Gasoline Direct Injection? | 03 |
| | (b) Explain EGR with the neat sketch | 04 |
| | (c) Describe the stages of combustion of HCCI in gasoline engines. | 07 |