

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- VII EXAMINATION-SUMMER 2023****Subject Code: 3170215****Date: 26/06/2023****Subject Name: Advance Combustion Technology of I.C. Engine****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

| | | MARKS |
|------------|--|--------------|
| Q.1 | (a) Explain Normal and Abnormal combustion in SI Engine. | 03 |
| | (b) Draw different type of combustion chamber for CI engines with neat sketch. | 04 |
| | (c) Write the Stages of Combustion processes in SI Engine with Proper Diagram. | 07 |
| Q.2 | (a) Write a short note on CRDI Engine. | 03 |
| | (b) Explain Exhaust Emission according to C.I Engine. | 04 |
| | (c) What is the function of fuel injector system and also Explain types of fuel injector for gasoline engine. | 07 |
| | OR | |
| | (c) Explain the most important features of the first-generation and the second generation gasoline direct injection engines. | 07 |
| Q.3 | (a) Explain in brief concept of lean boost combustion system. | 03 |
| | (b) Write short notes on fuel consumption as per Stratified Charged engine. | 04 |
| | (c) What are different types nozzle used for spray formation? Write comparison of nozzles. | 07 |
| | OR | |
| Q.3 | (a) What is stratified charge operation in case of gasoline direct injection? | 03 |
| | (b) Explain the following: (a) LNT (b) Emission Control Devices. | 04 |
| | (c) Write disadvantages of wall guided direction injection system. | 07 |
| Q.4 | (a) Differentiate Turbo charging and Supercharging. | 03 |
| | (b) Draw the Schematic diagram of SCR treatment. | 04 |
| | (c) Define term Downsizing. Explain any one method of downsizing. | 07 |
| | OR | |
| Q.4 | (a) Define Ignition lag in brief. | 03 |
| | (b) What is internal exhaust gas recirculation system and external exhaust gas recirculation system? | 04 |
| | (c) What the advantages are of turbocharge in GDI engine by combining direct injection. | 07 |
| Q.5 | (a) Give a brief detail on emission occur in HCCI engine. | 03 |
| | (b) Describe any one approach to HCCI operation in gasoline engines. | 04 |
| | (c) Enlist the controlling parameters for HCCI combustion for best fuel economy and low emissions in SI engine. | 07 |
| | OR | |
| Q.5 | (a) Write a short note on P-HCCI engine. | 03 |
| | (b) Explain working of direct injection gasoline engine with neat sketch. | 04 |
| | (c) Which are the primary objectives of gasoline HCCI engine and Diesel HCCI Engine? | 07 |
