

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: AU407
Course Name: ADVANCED IC ENGINES

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks.

Marks

- | | | |
|---|---|-----|
| 1 | a) What is meant by Detonation? How it happens? | (4) |
| | b) Explain the stages of combustion in SI engine with the help of Pressure – crank angle diagram | (6) |
| 2 | a) Explain the working of free piston engine with a suitable sketch and discuss its characteristics | (6) |
| | b) Explain the multiple injection in diesel combustion process | (4) |
| 3 | a) Discuss the stages of combustion in a dual fuel engine. | (5) |
| | b) Compare Dual and Multi fuel engine. | (5) |
| 4 | Discuss the effect of the following factors affecting combustion in Dual fuel engines. | |
| | a) Pilot fuel quantity | (5) |
| | b) Inlet temperature | (5) |

PART B

Answer any three full questions, each carries 10 marks.

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|---|---|------|
| 5 | a) What is the influence of high compression ratio employed in a lean burn engine? | (5) |
| | b) Explain the terms “Swirl and Squish” in a combustion chamber. | (5) |
| 6 | a) Explain how partial charge stratification is obtained in a Lean burn engine. | (5) |
| | b) What are the salient features of a gasoline lean burn engine? | (5) |
| 7 | a) Draw and explain the gas turbine setup with inter-cooling and re-heating. | (10) |
| 8 | Discuss about the following air management system in a Gas turbine with the help of sketches. | |
| | a) Primary air | (3) |
| | b) Secondary air | (3) |
| | c) Film cooling air | (4) |

PART C

Answer any four full questions, each carries 10 marks.

- 9 Explain the principle and operation of a Turbo charged stratified charge combustion in direct injection SI engines (10)
- 10 Elucidate the different combustion concepts used for achieving stratified charge combustion (10)
- 11 Explicate any two production engines with stratification (10)
- 12 With suitable sketches explain about the construction and working of an HCCI engine. (10)
- 13 a) What are the control methods that used in a CAI engine? (7)
b) How CAI / SI switching is done? (3)
- 14 a) Compare the emission characteristics of a SI engine and CAI engine. (4)
b) What are the applications of a two stroke CAI engine? (3)
c) What are the disadvantages of a CAI engine? (3)
