

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020

Course Code: AU409**Course Name: SIMULATION AND ANALYSIS OF IC ENGINE PROCESSES**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer any three full questions, each carries 10 marks.*

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|---|--|-------|
| 1 | a) What is meant by heat of reaction? | (5) |
| | b) What are the factors on which the adiabatic flame temperature depends on? | (5) |
| 2 | Explain the procedure for measurement of H_{rp} with a neat sketch. | (10) |
| 3 | Illustrate an ideal Otto cycle in the p-V diagram and derive an equation for thermal efficiency. | (10) |
| 4 | Discuss about SI engine simulation with adiabatic combustion under full load conditions. | (10) |

PART B*Answer any three full questions, each carries 10 marks.*

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|---|--|------|
| 5 | Explain the terms | (10) |
| | 1. Squish | |
| | 2. Swirl | |
| | 3. Mach index | |
| | 4. Volumetric efficiency | |
| 6 | Derive the efficiency of an ideal diesel cycle. | (10) |
| 7 | (a) List the assumptions needed for ideal cycle CI engine simulation with air as the working medium. | (5) |
| | (b) Illustrate the pressure-volume diagram for a diesel engine cycle under supercharged condition. | (5) |
| 8 | Explain the term "tuning and ram effect" in a combustion chamber. | (10) |

PART C*Answer any four full questions, each carries 10 marks.*

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| 9 | Discuss about trapping efficiency and scavenging efficiency of two stroke engines. | (10) |
| 10 | Explain the port diagram for a two stroke engine with a neat sketch. | (10) |
| 11 | Compare crankcase scavenged engine and separately scavenged engine. | (10) |
| 12 | Explain about the flow patterns through valves. | (10) |
| 13 | Explain the temperature distribution and heat flow across the combustion chamber wall with a neat sketch. | (10) |
| 14 | Explain any two methods used for the measurement of friction in a firing engine. | (10) |
