

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S5 (R,S) (FT/WP)(S3 PT) Examination November 2025 (2019 Scheme).

Course Code: CST307**Course Name: MICROPROCESSORS AND MICROCONTROLLERS**

Max. Marks: 100

Duration: 3 Hours

PART A*(Answer all questions; each question carries 3 marks)*

- | | | Marks |
|----|--|-------|
| 1 | Write any three differences between 8086 and 8088 architectures. | 3 |
| 2 | Specify the significance of 6-byte pre-fetch Queue in the architecture of 8086. | 3 |
| 3 | List any three flag manipulation instructions of 8086 and their functions. | 3 |
| 4 | Write about the uses of following assembler directives:

1) SEGMENT 2) ASSUME 3) EQU | 3 |
| 5 | An assembly language program has an instruction INT 20H. Find the segment address and offset address of its ISR. | 3 |
| 6 | Explain any three modes of operations of 8259. | 3 |
| 7 | Draw the architecture of 8254. | 3 |
| 8 | Explain about the handshaking signals of 8255. | 3 |
| 9 | Differentiate the features of microprocessor and microcontroller. | 3 |
| 10 | List any three addressing modes of 8051 with examples. | 3 |

PART B*(Answer one full question from each module, each question carries 14 marks)***Module -1**

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|----|--|---|
| 11 | a) A data having segment address is 4235H and offset address is 2198H. Calculate the actual physical address of data. Show the steps involved in the physical address calculation. | 6 |
| | b) Explain the register organization of 8086 with figures. | 8 |

- 12 a) Explain the physical memory organization of 8086 with figures. 6
b) List any eight signals of 8086 with their functions. 8

Module -2

- 13 a) Explain the data transfer instructions of 8086 with examples. 8
b) Write an assembly language program for 8086 to find whether the given 8-bit number is positive or negative. 6
- 14 a) Explain the shift and rotate instructions of 8086 with examples. 8
b) Write an assembly language program for 8086 to find the square root of an 8-bit number. (Assume the given 8-bit number is a perfect square) 6

Module -3

- 15 a) Explain the interrupt processing cycle of 8086 with flowchart. 7
b) Define the term interrupt. Explain the different types of interrupts in 8086. 7
- 16 a) Explain the architecture of 8259. 7
b) Explain the stack structure of 8086. 7

Module -4

- 17 a) Explain the architecture of 8255. 8
b) Explain the modes of operations of 8254. 6
- 18 a) Explain the architecture of 8257. 8
b) Explain the modes of operations of 8255. 6

Module -5

- 19 a) Explain the internal memory organization of 8051. 8
b) Write an 8051 program to find the largest number in an array of 8-bit numbers. 6
- 20 a) Explain about TCON and TMOD registers of 8051. 8
b) Write an 8051 program to find the sum of odd number in an array of 8-bit numbers. 6
