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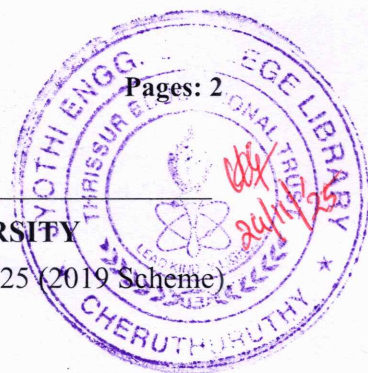
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Reg No.: \_\_\_\_\_

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:<br>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**

- |    |  |   |
|----|--|---|
| 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

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