

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

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Fifth Semester B.Tech Degree (S,FE) Examination January 2022 (2015 Scheme)

**Course Code: CS305****Course Name: MICROPROCESSORS AND MICROCONTROLLERS**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer all questions, each carries 3 marks.*

- |   |   | <b>Marks</b> |
|---|---|--------------|
| 1 | What is the importance of Bus High Enable signal of 8086?   | (3)          |
| 2 | List out any 3 differences between 8086 and 8088 microprocessors.   | (3)          |
| 3 | Differentiate between a macro call and a subroutine call.   | (3)          |
| 4 | Assume the current value in register AX is FFFDH and carry flag value is 0. What will be the new value in AX register after the execution of each of the following 8086 instructions: | (3)          |
|   | (a) RCR AX , 01H      (b) ROR AX , 01H      (c) SHR AX , 01H  |              |

**PART B***Answer any two full questions, each carries 9 marks.*

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|---|--|-----|
| 5 | Write an 8086 assembly language program to check whether a 16 bit number                             |     |
|   | a) stored at memory location <b>500AH : 2233H</b> is divisible by 5.                                 | (5) |
|   | b) What are assembler directives? Define the functions of the following assembler directives.        | (4) |
|   | (a) EQU      (b) PTR   |     |
| 6 | Draw the internal architecture of 8086 microprocessor and explain the functions of different blocks. | (9) |
| 7 | a) Draw and explain the flag register of 8086.   | (5) |
|   | b) Explain one method for resetting the TRAP flag of 8086.   | (4) |

**PART C***Answer all questions, each carries 3 marks.*

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|----|---|-----|
| 8  | Explain how 8086 computes the starting address of the ISR when it executes the instruction INT 21H. | (3) |
| 9  | Write short notes about the two hardware interrupt signals available in 8086.                       | (3) |
| 10 | Differentiate I/O mapped and memory mapped interfacing concepts.                                    | (3) |
| 11 | What are the two priority schemes associated with 8257?   | (3) |

**PART D**

*Answer any two full questions, each carries 9 marks.*

- 12 Design an interface between 8086 microprocessor and two 4K x 8 EPROM and two 4K x8 RAM memory modules. The RAM address must start at 00000H. (9)
- 13 a) Discuss about the steps followed by 8086 when it detects an interrupt signal in the INTR pin. (5)  
b) Discuss the predefined interrupts in 8086 (4)
- 14 a) Draw and explain the architecture of a Programmable Interrupt Controller. (5)  
b) Determine the value to be loaded in control word register of 8255 if it has to be interfaced with 8086 in such a way that ports A & B are to be configured as input ports and port C is to be configured as output port? All ports are assumed to be in mode 0. (4)

**PART E**

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

- 15 a) How does a microcontroller differ from a microprocessor? (5)  
b) Discuss about different factors which decide the selection of a microcontroller for a specific application. (5)
- 16 a) “8051 has bit addressable and byte addressable registers.”  
i) What is the difference between the above two types of registers?  
ii) Classify the following 8051 registers into bit-addressable or byte-addressable groups: Registers are *A, P0, P1, SP* (5)
- b) How do the stack operations of 8051 differ from that of 8086? (5)
- 17 a) Explain the functions of the following components of 8051 microcontroller: (5)  
(i) Processor Status Word (ii) DPTR  
b) Write short note on interrupt structure of 8051 microcontroller (5)
- 18 a) What is meant by addressing mode of an instruction? Discuss about any three addressing modes supported by 8051 microcontrollers. (7)  
b) What will be the effect of execution of each of the following 8051 instructions if register A contains the value 89H? (3)  
(i) CPL A (ii) RL A (iii) SWAP A
- 19 Write an 8051 assembly language program to check whether an 8 bit number stored in internal memory 5FH is a power of 2. If the number is a power of 2 write FFH in register R0. (10)
- 20 What is the need of 8254 chip? Explain any two modes of operation of 8254. (10)

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