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**Presidency University**

**Bengaluru**

 **SCHOOL OF ENGINEERING**

**SUMMER TERM END TERM EXAMINATION-AUGUST 2024**

**Odd Semester**: 2023 - 24

**Course Code**: ECE 1004

**Course Name**: Microprocessor Based Systems

**Program & Sem**: B. Tech & Sem II

**Date**: 06/08/2024

**Time**: 1:00 pm to 4:00 pm

**Max Marks**: 100

**Weightage**: 50 %

 **Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Scientific and non-programmable calculators are permitted.*

**Part A [Memory Recall Questions]**

**Answer any five Questions. Each question carries 4 marks. (5Qx 4M= 20M)**

1. There are different types of addressing modes available in 8086. The instruction OR AL, 12h is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_addressing mode. Mention the content of AL after execution of this instruction. [4M], (CO3, Knowledge)

2. Address lines are primarily used to interface memory. A larger number of address lines can access a large amount of memory. Determine the number of address lines required to access a 6M memory chip [4M] (CO4, Knowledge)

3. Interrupts are used to service subroutines or other peripheral devices. How many hardware and software interrupts are there in 8086. [4M] (CO5, Knowledge)

4. Arithmetic instructions are very useful in number crunching. Write two examples of arithmetic instructions. [4M] (CO1, Knowledge)

5. The flag register is used to store the status of the results in arithmetic and logic operations. In 8086 how many control flag are there? What are they? [4M] (CO3, Knowledge)

6. ROL instruction is used to rotate the bits of byte towards the left. Interpret the result of the following instruction: ROR BL, 05H [4M] (CO3, Knowledge)

7. Write an ALP for 8086 instruction to exchange the contents of AX & BX registers [4M] (CO1, Knowledge)

**Part B [Thought Provoking Questions]**

**Answer any four Questions. Each question carries 10 marks. (4Qx10M=40M)**

8. String instructions are a set of instructions that manipulate strings in memory. They operate on contiguous linear arrays of memory, also known as blocks. Write few examples of String manipulation instruction.   [10M] (CO3, Application)

9. Addressing modes are used to interact with a registers and the memory to perform various operations. Which addressing mode is used store directly the data in the registers? Explain with 2 suitable examples [10M] (CO2, Application)

10. Convert (10010101)2 =( ? )H=( ? )8 =( ? )10

 (FC10)2 =( ? )10 = ( ? )2 =( ? )8 [10M] (CO1, Application)

11. The assembly language program is used by the user to program 8086. How does 8086 be programmed to find the number of 1's in 8 bit number. [10M] (CO3, Comprehension)

12. A string is a data type commonly used in computer programming to represent text. It consists of a sequence of characters, etc. Write an ALP to transfer a block of 20 data for data segment to extra segment [10M] (CO2, Application)

13. The address generation of 8086 happens with 2 registers. 16-bit segment register values are combined with an offset to get the physical addresses in an 8086 processor. Given that the DS contains 2234h and the offset address is 0134h, then calculate the following addresses

(i) Lower Range address in the Data Segment (ii) Upper Range address in the Data Segment

(iii) Logical address (iv) Physical address [10M] (CO1, Application)

**Part C [Problem Solving Questions]**

**Answer any two Questions. Each question carries 20 marks. (2Qx20M=40M)**

15. 8086 is a very efficient and meticulously designed microprocessor with pipelining architecture. Draw a complete architecture diagram explaining the blocks along with the PIN-out diagram of 8086. [20M] (CO1, Comprehension)

16. The entire group of instructions that a microprocessor supports is called Instruction Set, Explain the Arithmetic, logical, stack and string instruction of 8086 with 4 examples each. [20M] (CO3, Comprehension)

17.Write an ALP to add, divide and multiply two numbers AFH and C9H. Find the Square of the division quotient and store it in a location named as RES. [10M] (CO1, Application)