



Fourth Semester B.E. Degree Examination, June/July 2023

Microprocessors

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the architecture of 8086 cpu with a neat diagram. (08 Marks)
- b. Explain the following addressing modes with an example to each:
i) Immediate ii) Register iii) Direct iv) Relative based indexed. (04 Marks)
- c. Explain the pin functions of the following:
i) ALE ii) $\overline{\text{LOCK}}$ iii) $\overline{\text{BHE/S7}}$ iv) $\overline{\text{TEST}}$ (04 Marks)

OR

- 2 a. Explain the operation performed by the following 8086 instructions with a numerical example:
i) AAA ii) LDS iii) CALL iv) XLAT (08 Marks)
- b. Differentiate between the following instructions:
i) MOV BX, offset TABLE and LEA BX, TABLE (04 Marks)
- ii) SUB AX, CX and CMP AX, CX
- c. The opcode for MOV instruction is "100010". Determine the machine code for the following instructions:
i) MOV AL, [BX] ii) MOV 40H [SI], CL (04 Marks)

Module-2

- 3 a. Explain the following instructions with an example to each:
i) IDIV ii) TBST iii) WAIT. (08 Marks)
- b. What do you mean by assembler directive? Explain the following assembler directives with example:
i) ASSUME ii) PUBLIC and EXTERN. (04 Marks)
- c. Write an ALP to convert an 8-bit binary number to equivalent BCD number. (04 Marks)

OR

- 4 a. Explain any 3 string instructions of 8086. (06 Marks)
- b. Write an ALP to count EVEN and ODD numbers in the given array of twenty eight bit numbers. (06 Marks)
- c. Differentiate between the following:
i) AND and TEST ii) SHIFT and ROTATE. (04 Marks)

Module-3

- 5 a. Explain the stack structure of 8086 in detail. (06 Marks)
- b. Write an ALP to generate a delay of 100msec using the microprocessor that operates at 5MHZ frequency show all calculations. (04 Marks)
- c. Write an ALP to find the factorial of a number using procedure. (06 Marks)

OR

- 6 a. Draw and discuss interrupt structure of 8086 in detail. Explain TYPE 2 interrupt in detail. (08 Marks)
- b. Differentiate between a procedure and macro. (04 Marks)
- c. Define a Macro "SQUARE" that calculates square of a number. (04 Marks)

Module-4

- 7 a. Draw and discuss the read and write. Timing diagram of 8086 in maximum mode. (08 Marks)
- b. Explain the internal architecture of 8255 PPI with a neat diagram. (08 Marks)

OR

- 8 a. Interface eight digits of seven segment display using 8255 with 8086. (08 Marks)
- b. Interface TWO $8K \times 8$ and TWO $4K \times 8$ RAM chips with 8086. (08 Marks)

Module-5

- 9 a. Draw a typical stepper motor interface with 8086 using 8255. Write an ALP to rotate. Stepper motor in clock wise direction at an angle of 270° with a delay between each step is equal to 1m sec. Show all calculations. [Given step angle of motor = 1.8° and microprocessor is operating at 10MHZ frequency]. (12 Marks)
- b. Explain the following keyboard handling INT 21H das function.
i) Function 09H ii) Function 02H. (04 Marks)

OR

- 10 a. Differentiate between:
i) Harvard Architecture and Von Neuman architecture
ii) RISC and CISC architecture. (06 Marks)
- b. Explain the significance of different bits of control word register format of 8253/54. (06 Marks)
- c. Write a program to generate a SQUARE WAVE using DAC 0800. (04 Marks)

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