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Future Vision

By K B Hemanth Raj

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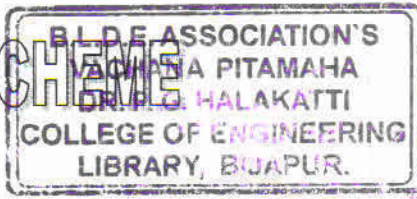
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15CS44

Fourth Semester B.E. Degree Examination, June/July 2019 Microprocessors and Microcontrollers

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. With a neat diagram, explain the internal block of 8088/8086 CPU. (10 Marks)
- b. Find errors if there are any and correct the same : (06 Marks)
- | | | |
|-------------------|----------------|-------------------|
| (i) MOV AL, 1239H | (ii) PUSH BL | (iii) MOV 12H, BL |
| (iv) ADD 15H, 13H | (v) MUL AX, BX | (vi) ROL AX, 06H |

OR

- 2 a. Define addressing modes. List and explain various addressing modes present in the 8086 microprocessor. (08 Marks)
- b. Assume that DS = 4500, SS = 2000, BX = 2100, SI = 1486, DI = 8500, BP = 7814 and AX = 2512. (08 Marks)
- All the values are in HEX. Show the exact physical memory location where AX is stored in each of the following :
- | | |
|----------------------|----------------------|
| (i) MOV [BX]+20, AX | (ii) MOV [SI]+10, AX |
| (iii) MOV [DI]+4, AX | (iv) MOV [BP]+12, AX |

Module-2

- 3 a. Write an Assembly Language Program (ALP) to calculate the total sum of 6 bytes of data. The decimal data is as follows: 125, 235, 197, 91, 100 and 48. Write suitable comments. (06 Marks)
- b. Explain the following instructions with suitable examples. (10 Marks)
- | | | | |
|---------|----------|-----------|----------|
| (i) DAA | (ii) RCR | (iii) RCL | (iv) MUL |
|---------|----------|-----------|----------|

OR

- 4 a. Write an assembly language program to convert lower case to upper case for the following sentence. "i aM pROud KanNaDIGA". Use suitable comments. (06 Marks)
- b. Explain the following : (10 Marks)
- | | | | |
|--------------------------|---------------------------|----------------------------|---------------------------|
| (i) INT 10H function 06H | (ii) INT 10H function 02H | (iii) INT 21H function 09H | (iv) INT 21H function 01H |
| | | | (v) INT 21H function 02H |

Module-3

- 5 a. Show how the computer would represent the following bytes of data: (06 Marks)
- | | | | |
|--------|---------|------------|---------------------------|
| (i) -5 | (ii) -7 | (iii) -34H | (iv) -128 ₍₁₀₎ |
|--------|---------|------------|---------------------------|
- b. Explain the following with suitable examples: (05 Marks)
- | | |
|----------|------------|
| (i) XLAT | (ii) SCANB |
|----------|------------|

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

- c. Assuming that there is spelling of "VISVESVARAYA" in an electronic dictionary and a student type "VISHVESVARAYYA". Write an Assembly Language Program that compares these two and display the following messages depending on the result.
- (i) If they are equal "The spelling is correct"
 - (ii) If they are not equal "Wrong spelling".
- (05 Marks)

OR

- 6 a. Explain briefly checksum byte and mention the methods being used to check the data integrity in the following storage types: ROM, DRAM, Hard Disks. (06 Marks)
- b. Write the 8255 control word format of I/O mode. (04 Marks)
- c. Explain IN and OUT instructions with examples. (06 Marks)

Module-4

- 7 a. Write the difference between microprocessors and microcontrollers. (04 Marks)
- b. Explain the major design rules to implement the RISC philosophy. (08 Marks)
- c. Write a short note on software abstraction layers executing on hardware. (04 Marks)

OR

- 8 a. With a neat diagram, explain registers available in ARM in user mode along with generic program status Register. (06 Marks)
- b. What is pipeline in ARM? Illustrate with an example. Show the pipeline stages of ARM7, ARM9 and ARM10. (10 Marks)

Module-5

- 9 a. Explain MOVE instructions in ARM with suitable examples. (08 Marks)
- b. Explain the following with examples:
- (i) MLA
 - (ii) QADD
 - (iii) SMULL
 - (iv) LSL
- (08 Marks)

OR

- 10 a. Write the arithmetic instructions of ARM. (06 Marks)
- b. Write the register transfer instructions of ARM (04 Marks)
- c. Explain with example forward and backward branch in ARM. (06 Marks)

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