CBCS SCHEME

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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 :
(i) MOV AL, 1239H (ii) PUSH BL (iii) MOV 12H, BL
(iv) ADD 15H, 13H (v) MUL AX, BX (vi) ROL AX, 06H **(06 Marks)**

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.
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 **(08 Marks)**

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.
(i) DAA (ii) RCR (iii) RCL (iv) MUL **(10 Marks)**

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 :
(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 **(10 Marks)**

Module-3

5 a. Show how the computer would represent the following bytes of data:
(i) –5 (ii) –7 (iii) –34H (iv) $-128_{(10)}$ **(06 Marks)**

b. Explain the following with suitable examples:
(i) XLAT (ii) SCANB **(05 Marks)**

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 among 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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