

# CBCS SCHEME

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15CS44

## Fourth Semester B.E. Degree Examination, Feb./Mar. 2022 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 sketch, explain architecture of 8086. (08 Marks)  
b. Explain with example the various addressing modes of 8086. (08 Marks)

OR

- 2 a. Write an ALP to add 10. 8 bit numbers and store the result in memory called SUM, with suitable comments. Identify all the directives found in the program. (08 Marks)  
b. Calculate the physical address for the following instructions. Assume DS = 1000H, SS = 2000H, ES = 3000H, BP = 0100H, SI = 0200H, DI = 0300H, BX = 0700H, values = 0500H.  
(i) MOV ES : [1000H], 20H  
(ii) MOV CX, Values [BX] [DI]  
(iii) ADD AL, [BP + 80H]  
(iv) MOV AX, [BX] [DI] (08 Marks)

### Module-2

- 3 a. Write an ALP using BIOS INT 10H to and DOS INT 21H:  
(i) Clear the screen  
(ii) Set the cursor at the center of the screen.  
(iii) Display message "Assembly Language Programming is fun" at the center of the screen with suitable comments. (08 Marks)  
b. With suitable examples, explain rotate instructions. (08 Marks)

OR

- 4 a. Write an ALP to convert:  
(i) Packed BCD to ASCII  
(ii) ASCII packed BCD , with suitable comments. (08 Marks)  
b. Explain the sequence of operations when an interrupt occurs. Also explain IVT of 8086. (08 Marks)

### Module-3

- 5 a. Explain string instructions with suitable example. (08 Marks)  
b. Write an ALP to find the average temperature given a set of temperature as below:  
-20, +10, +15, -35, +12, +30, +28, -5  
Store the average temperature in AVG. (08 Marks)

OR

- 6 a. Explain handling of overflow problem that arises in addition of signed numbers with a suitable example. (06 Marks)  
b. Explain 74138 decoder configuration to enable the memory address F0000H to F7FFFH to connect four 8K RAMs. (06 Marks)  
c. Explain XLAT instruction with example. (04 Marks)

**Module-4**

- 7 a. Explain in detail RISC design philosophy. (06 Marks)  
b. Explain with a neat diagram the registers available in ARM in user mode. (04 Marks)  
c. Explain in detail exceptions, interrupts and the vector table, of ARM7. (06 Marks)

OR

- 8 a. Explain ARM core data flow model with a neat diagram. (06 Marks)  
b. Differentiate between CISC and RISC processors. (06 Marks)  
c. Discuss briefly how coprocessor can be attached to ARM processor. (04 Marks)

**Module-5**

- 9 a. Illustrate with example the use of barrel shifter with arithmetic instructions. (06 Marks)  
b. Explain different branch instructions of ARM processor. (06 Marks)  
c. Explain with examples single register load-store instructions. (04 Marks)

OR

- 10 a. Explain with example coprocessor instructions with respect to ARM processor. (06 Marks)  
b. Explain the instructions which directly control a Program Status Register (PST). (06 Marks)  
c. Explain SWAP instructions of ARM processor. (04 Marks)

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