CBCS SCHEME

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17CS44

Fourth Semester B.E. Degree Examination, July/August 2022
Microprocessors and Microcontrollers

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. With a neat block diagram, explain the architecture of 8086. **(10 Marks)**

b. Explain the flag register of 8086 microprocessor. **(05 Marks)**

c. Assume that S_P = 1236, A_X = 24B6. DI = 85C2 and DX = 5F93. Show the contents of the stack for each of the following instructions are executed.
PUSH DX
PUSH DI
PUSH DX. **(05 Marks)**

OR

2 a. Explain the following addressing modes
i) Register Indirect
ii) Base relative
iii) Indexed Relative
iv) Based Index Relative
v) Immediate. **(10 Marks)**

b. What is an assembler directives? With example explain the following assembler directives:
i) Assume ii) ORG iii) db iv) EQU. **(10 Marks)**

Module-2

3 a. Describe the following instructions with example:
i) LEA ii) XCHG iii) DAA iv) MUL v) ADD. **(10 Marks)**

b. Write an ALP to convert packed BCD to ASCII conversion. **(10 Marks)**

OR

4 a. Explain shift and rotate instructions. **(12 Marks)**

b. Write an ALP that adds four words of data and stores the result. **(08 Marks)**

Module-3

5 a. Explain the following instructions with examples:
i) CBW ii) IDIV iii) CMPSB iv) XLAT v) MOVSW. **(10 Marks)**

b. Consider 4 bytes of hexa decimal data 25H, 62H, 3FH and 52H.
i) Find the checksum
ii) Perform checksum operation
iii) If 62H is changed to 22H show how checksum detects error. **(10 Marks)**

OR

6 a. Differentiate between memory mapped I/O and I/O mapped I/O. **(08 Marks)**
b. With a block diagram, explain 8255. **(08 Marks)**
c. Write the control word register of 8255. **(04 Marks)**

Module-4

7 a. Explain with neat diagram of ARM core registers bank in detail. **(12 Marks)**
b. Explain the typical embedded system software in detail. **(08 Marks)**

OR

8 a. Explain the interrupt vector table of ARM core and also explain the steps taken by ARM core when exception/interrupt occurs. **(10 Marks)**
b. Describe various modes of operations of ARM processor. **(10 Marks)**

Module-5

9 a. Explain the following ARM instructions with example:
i) MVN ii) RSB iii) ORR iv) MLA v) LDR. **(10 Marks)**
b. Explain the arithmetic instructions of ARM. **(10 Marks)**

OR

10 a. Describe load multiple and store multiple instructions of ARM processor with example. **(10 Marks)**
b. With example explain SWAP instruction of ARM. **(04 Marks)**
c. Explain the different barrel shifter operations. **(06 Marks)**

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