CBCS SCHEME

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17CS44

Fourth Semester B.E. Degree Examination, Jan./Feb.2021
Microprocessor & Microcontroller

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 diagram, explain the working of a 8086 microprocessor. **(10 Marks)**

b. Explain the following 5 addressing modes of 8086 microprocessor:
(i) Register addressing mode.
(ii) Direct addressing mode.
(iii) Register indirect addressing mode.
(iv) Base relative addressing mode.
(v) Based indexed addressing mode.
with example for each. **(10 Marks)**

OR

2 a. Write an assembly language program to add 5 numbers present in the datasegment. **(06 Marks)**

b. Explain the following 4 assembler directives of 8086 :
(i) dup (ii) DD (iii) EQU (iv) ORG
with syntax and examples. **(08 Marks)**

c. Explain all bits of a 8086 flag register. **(06 Marks)**

Module-2

3 a. Explain the interrupt mechanism in 8086 microprocessor. **(08 Marks)**

b. Explain use of these instructions with syntax (i) DAA (ii) MUL (iii) ROR (iv) DIV. **(08 Marks)**

c. Explain the NMI interrupt. **(04 Marks)**

OR

4 a. Write an ALP to read a string of maximum length of 50 bytes and clear the screen and display the read string at location 12H, 28H on the monitor. **(10 Marks)**

b. Explain the following instructions with its syntax:
(i) CMP (ii) DAS (iii) CALL (iv) XCHG (v) SAR **(10 Marks)**

Module-3

5 a. Interface 4, 32 K RAM to 8086 microprocessor. You may choose the address range of your own. Show the memory map. **(10 Marks)**

b. Explain the following string instructions:
(i) CMPSB (ii) SCASB (iii) LODSB (iv) MOVSB
(v) STOSB **(10 Marks)**

OR

6 a. Interface 8086 with 8255 chip such that Port A is output port and Port B is input port. Let the addresses be 1100h, 1101h, 1102h, 1103h for Port A, Port B, Port C and control register respectively. Write a program to read from Port B and write it to Port A. **(10 Marks)**

b. Explain the following instructions:
(i) IDIV (ii) IMVL (iii) CBW (iv) XLAT **(10 Marks)**

Module-4

7 a. Explain RISC design philosophy. **(08 Marks)**

b. Explain the instruction set for embedded systems. **(06 Marks)**

c. Explain the embedded system hardware. **(06 Marks)**

OR

8 a. Explain the data flow model of a typical ARM core. **(08 Marks)**

b. Explain the registers in a ARM microcontroller. **(08 Marks)**

c. What is CPSR? Explain. **(04 Marks)**

Module-5

9 a. Explain the role of barrel shifter in ARM processors. **(06 Marks)**

b. Explain the following instructions:
(i) RSC (ii) SBC (iii) EOR (iv) AND **(08 Marks)**

c. Explain the MLA and SMLAL instructions with example. **(06 Marks)**

OR

10 a. Write a program to copy a block of memory to another area in the memory. **(10 Marks)**

b. Explain the following instruction with syntax:
(i) STMED (ii) SWP (iii) SWI (iv) CMP **(10 Marks)**

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