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15CS44

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.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. Explain with neat block diagram, the architecture of 8086 microprocessor. **(08 Marks)**
    b. What are Addressing Modes? Discuss its types with suitable examples. **(08 Marks)**

OR

2   a. Develop an assembly language program to calculate the sum of 5 bytes of data. **(05 Marks)**
    b. With a neat block diagram, explain the three steps to create executable assembly language program. **(06 Marks)**
    c. What are assembler directives? Discuss any three directives with examples. **(05 Marks)**

Module-2

3   a. Discuss shift and rotate instruction of 8086 microprocessor with examples. **(08 Marks)**
    b. Explain with suitable examples the logical instructions of 8086 microprocessor. **(04 Marks)**
    c. Discuss multiplication (MUL) and division (DIV) instructions of 8086 microprocessor.
    (04 Marks)

OR

4   a. What are interrupts? Discuss interrupt vector table with diagram for 8086 microprocessor.
    (06 Marks)
    b. Write an assembly language program for 8086 that :
       i) Clears the screen
       ii) Sets the cursor at the centre of screen. **(05 Marks)**
    c. Develop an assembly language program for 8086 to convert Binary Coded Decimal (BCD) to ASCII. **(05 Marks)**

Module-3

5   a. Explain the string instructions (MOVS, LODS, STOS, CMPS and SCAS) with suitable examples. **(08 Marks)**
    b. Discuss the sign extension of 8 bit and 16 bit operands [CBW and CWD] in 8086 with suitable examples. **(08 Marks)**

OR

6   a. Discuss 8086 input/output (IN and OUT) instructions with examples. **(04 Marks)**
    b. Explain 8255 and its control word format with diagrams. **(08 Marks)**
    c. Explain the features of 8255 PPI. **(04 Marks)**

Module-4

7   a.   Discuss the processor modes of CPSR with respect to ARM processor.   (06 Marks)
    b.   Write the comparison between microprocessor and microcontrollers.   (04 Marks)
    c.   Explain with neat block diagram the ARM based embedded device microcontroller.
        (06 Marks)

OR

8   a.   Discuss the following with diagrams :
        i)   Von Neumann architecture with cache
        ii) Harvard architecture with TCM.   (08 Marks)
    b.   Explain the pipeline mechanism in (Advanced RISC Machine)ARM processor.   (08 Marks)

Module-5

9   a.   Discuss the comparison instructions with examples with respect to ARM processor.
        (05 Marks)
    b.   Explain the Barrel shifter operation in ARM processor with diagram.   (06 Marks)
    c.   Explain the arithmetic instructions with examples with respect to ARM process.   (05 Marks)

OR

10 a.   Explain briefly co-processor instructions of ARM processor.   (04 Marks)
    b.   Discuss the load store instructions with respect to :
        i)   Single Register Transfer
        ii) Multiple Register Transfer.   (07 Marks)
    c.   Write a short note on Swap instructions with examples with respect to ARM processor.
        (05 Marks)

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