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15EC42

Fourth Semester B.E. Degree Examination, July/August 2021 Microprocessor

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1
 - a. With a relevant diagram, explain the register organization of 8086. (08 Marks)
 - b. List any three the advantages of memory segmentation. (03 Marks)
 - c. The contents of different registers are shown below. Form the effective addresses for the instructions given below. Offset (displacement) = 5000H.
 [AX] = 1000H, [BX] = 2000H, [SI] = 3000H, [DI] = 4000H, [BP] = 5000H, [SP] = 6000H, [CS] = 0000H, [DS] = 1000H, [SS] = 2000H, [IP] = 7000H.
 - i) MOV AX, [5000H]
 - ii) MOV AX, [BX]
 - iii) MOV AX, 5000H[Bx]
 - iv) MOV AX, [BX] [SI]
 - v) MOV AX, 5000H [BX] [SI]. (05 Marks)

- 2
 - a. Explain PUSH AX and POP AX instructions with steps involved. (05 Marks)
 - b. Write an 8086 ALP to multiply two 8 bit signed numbers. Give example for different cases. (06 Marks)
 - c. If the machine code for OP CODE MOV is 100010, find the hex codes for,
 - i) MOV AX, BX
 - ii) MOV AX, [BX] (05 Marks)

- 3
 - a. Explain different string handling instructions. (05 Marks)
 - b. Write an 8086 ALP for the addition of two 3×3 matrices shown below. The matrices are stored in the form of lists (row wise). Store the result of addition in the third list.

MAT1 =	$\begin{bmatrix} 01H & 02H & 03H \\ 04H & 05H & 06H \\ 07H & 08H & 09H \end{bmatrix}$	MAT2 =	$\begin{bmatrix} 11H & 22H & 33H \\ 44H & 55H & 66H \\ 77H & 88H & 99H \end{bmatrix}$
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(05 Marks)
 - c. Explain the following instructions with example
 - i) AAA
 - ii) SAR
 - iii) NEG. (06 Marks)

- 4
 - a. Explain the following assembler directives with example.
 - i) ORG
 - ii) PTR
 - iii) PROC. (06 Marks)
 - b. Write an 8086 ALP to convert an 8 bit binary number into equivalent BCD code. (05 Marks)
 - c. If [CL] = 36, find the contents of register BL after execution of following set of instructions


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MOV BL, 1
MOV AL, 0
UP : CMP CL, 0
      JZ END
      SUB CL, BL
      INC AL
      ADD BL, 02
      JMP UP
END : MOV BL, AL
                    
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(05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 5 a. What is an interrupt vector table? With a diagram, explain the structure of interrupt vector table of 8086. (06 Marks)
- b. Write an 8086 ALP to generate a delay of 1 minute if 8086 system frequency is 10MHz. Show the calculation for delay. (06 Marks)
- c. With timing diagram, explain the interrupt acknowledgement cycle of 8086. (04 Marks)
- 6 a. Write an 8086 procedure to convert a packed BCD number in AL to ASCII equivalent in AX. (04 Marks)
- b. Differentiate between procedure and macro. (04 Marks)
- c. Explain any four ways to pass parameters to procedure. (08 Marks)
- 7 a. Sketch the minimum mode configuration of 8086 and briefly explain the operation. (06 Marks)
- b. Design an interface between 8086 CPU and two chips of 16K×8 EPROM and two chips of 32K×8 RAM. Select the starting address of EPROM suitably. The RAM address must start at 00000H. (10 Marks)
- 8 a. Give the steps for interfacing an IO device to 8086. (03 Marks)
- b. With a neat block diagram, explain the internal architecture of 8255. (08 Marks)
- c. Explain the structure of control word register format of 8255 for BSR mode. (05 Marks)
- 9 a. Draw a schematic diagram for interfacing DAC0800 to 8086 using 8255. Write an ALP to generate a triangular wave of frequency 500Hz. Assume 8086 system frequency as 8MHz. The amplitude of the triangular wave should be +5V. (08 Marks)
- b. With a diagram, explain the internal architecture of 8253/54. (08 Marks)
- 10 a. Give any four differences between 8088 and 8086 microprocessors. (04 Marks)
- b. With a diagram, explain the interconnection of 8087 with 8086 microprocessor. (08 Marks)
- c. Using INT 21H DOS function call, write an ALP to display the message "MICROPROCESORS" on the display screen of the computer. (04 Marks)
