CBCS SCHEME

USN | | | | | | | | | | |

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 OPCODE 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.

$$MAT1 = \begin{bmatrix} 01H & 02H & 03H \\ 04H & 05H & 06H \\ 07H & 08H & 09H \end{bmatrix} \quad MAT2 = \begin{bmatrix} 11H & 22H & 33H \\ 44H & 55H & 66H \\ 77H & 88H & 99H \end{bmatrix}$$ **(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

```
        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
```
(05 Marks)

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)

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