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INTERNATIONAL CENTRE FOR APPLIED SCIENCES

(Manipal University)

III SEMESTER B.S. DEGREE EXAMINATION – OCT. / NOV. 2017

SUBJECT: COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING

(CS232) (BRANCH: Computer Science /Computer Engg.)

Monday, 6 November 2017

Time: 3 Hours **Max. Marks: 100**

- ✓ **Answer ANY FIVE full Questions.**
- ✓ **Missing data, if any, may be suitably assumed**

1. A. With a neat block diagram, explain the architecture of 8086 microprocessor. [12]
   B. Explain the following addressing modes of M68HC11 microcontroller giving examples for each
   i. Immediate
   ii. Inherent
   iii. Indexed
   iv. Extended [8]

2. A. The contents of the registers are listed below:

Register	Value	Register	Value
BX	8000	CS	3300
BP	9A00	DS	5800
SI	0006	SS	4400

Using these values, determine the effective address and the physical address of the byte/word location read or written in each of the following instructions:

i) SUB [BX+SI], CL

ii) ADD AX, [BP+10H]

Also write the addressing mode and the operation performed by each of the instructions. All values provided are in hexadecimal. All answers must also be provided in hexadecimal. [8]

B. Discuss the operation performed by the following M68HC11 instructions with an example for each..

i)BRSET ii) TSTB iii) BITA iv)NEGA [8]

C. Distinguish between macros and procedures

[4]

3. A. Write a program in 8086 instructions to find second largest number and average of given set of N 8 bit numbers, stored in memory. Store the result in two consecutive locations of memory.

[12]

B. Explain Input Interlocked and Output Interlocked Full Handshake Parallel I/O mode in M68HC11with the help of neat flowcharts [8]

4. A. Write a near procedure named multiply that computes the product of two unsigned 16-bit operands. Make use of this procedure in the main program to multiply two 32 bit numbers stored in memory and store the result in memory. Use registers to pass the parameters to the procedure. Write the program using 8086 instruction set. [12]

B. Write a program using M68HC11 instruction set to sort the elements of an array of N bytes stored in memory, in ascending order. The elements of the array and the number N is stored in memory.

[8]

5. A. Explain the following BIOS interrupt function requests:
   (i)To set cursor shape
   (ii)To read cursor position [6]

   B. Write a program using 8086 instruction set to convert one byte packed BCD number into ASCII format. Assume that the packed BCD number is stored in memory and store the result in memory.

   [6]

   C. Explain the actions taken by M68HC11 when reset occurs. [8]

6. A. Write a program using 8086 instruction set to accept a string from the keyboard. Count the number of vowels in the string and display the result on the screen. Assume that the count is a single digit number. Display appropriate messages,

[12]

B. Explain the various PUSH instructions of M68HC11 [8]

7. A. Explain the following string instructions of 8086 giving its syntax and an example for each.
   i)MOVS (ii)CMPS (iii)SCAS

   [12]

   B. Write a program using M68HC11 instruction set to find the larger of two 32 bit numbers stored in memory and store the result in memory. [8]

8. A. Explain the operation performed by the following instructions of 8086 with a numerical example for each
   (i) DAA (ii)AAS (iii)AAM [12]
   B. Explain any four general purpose interrupts of M68HC11 [8]