BITS,PILANI-DUBAI

International Academic City, Dubai

Year II – semester II - [All Sections] 2007-2008

Comprehensive Test

Course No. ES UC 263 Course Title : Microprocessor

Date : May 21,2008 Time 3 hours weightage: 40%

Note: 1- Answer each part in a separate booklet
2.Answer all questions sequentially
3.Marks are shown in the brackets against each question.

Part A

1. Convert the binary coded hexadecimal number into hexadecimal number.
   0001 1100 1111 . 1110 [1 M]
2. Draw the conceptual view of Pentium-4 microprocessor [1 M]
3. In real mode, show the starting address and ending address of each segment located by the following segment register values.
   1200 H, AB00H [1 M]
4. Write all the special purpose registers that are available in Intel 8086 through Pentium 4 processors. [1M]
5. Explain any 3 type of addressing modes with an example? [3 M]
6. Explain how Base relative –plus-index addressing used to access a file that contains multiple records with neat diagram. [2 M]
7. Convert the following assembly language to machine language.

   MOV SP, BX (SP=100 BX=011) [2 M]

8. Compare these two instructions.
   LEA BX, LIST
   MOV BX, OFFSET LIST
9. What does PUSHA instruction accomplish?

Part B

Give the full form of the following abbreviations

a. SRAM
b. DRAM
c. EEPROM
d. PLA [1M]

2. Define address decoding. Mention any two devices which can be used for address decoding [1M]
3 Use a 512 X 8 PROM for address decoding of a 32K EPROM memory (arranged as 4kX8).Show how the PROM is programmed for different outputs. Show the memory map of each EPROM, the starting address must be 80000H. [3M]
4 a. Why is BIOS interrupt used ? What is the interrupt number ? [1M]
b. Write a program to clear the screen, than position the cursor to the top left position of the screen and display the message " ALL THE BEST".[2M]
5. With the help of neat figures show the working of the near call and the far call. [1M]
6 Write a procedure to check the occurrence of 00 in a block of size 200 bytes using a string comparison instruction. [1M]
7 Give commands to do each of the following
   a. Set bits 4-7 of a number in AL to 1, bits 0-3 are unaltered.
   b. Clear bits 4-7 of AL and leave bits 0-3 unaltered.
   c. To invert bits 4-7 of AL and leave bits 0-3 unaltered. [2M]

Part C

What information appears on the address/data bus of 8088 while ALE is active? [1.5M]

2. Explain the operation of TEST pin and WAIT instruction [1M]

3- Explain the operation of LOCK pin [1M]

4- When $\overline{DT/R}$ is logic 1 what condition does it indicate about the operation of 8086/8088 [1M]

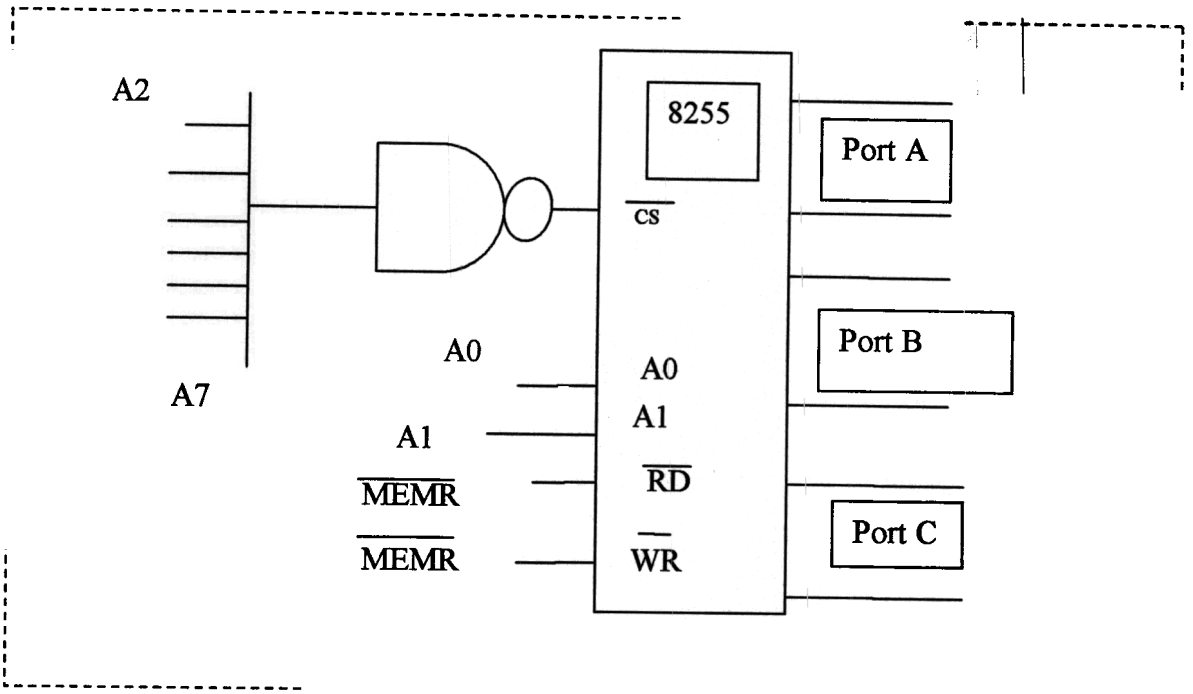
5- How much time is allowed for memory access when the 8086/8088 is operated with 10 MHZ clock? Calculate how many MIPS should be obtained with that clock.?. [2M]

6-explain the term ***Handshaking*** as it applies to computer I/O system. [2.5M]

7-develop an I/O port decoder using a 74ALLS138 ,which generates high bank I/O strobes for the following 8 bit I/O port addresses:11H,13H,15H,17H,19H,1BH,1DH,and 1FH. [2M]

8. Next figure shows a parallel input /output interface device [8255A] used to transfer data between microprocessor and and input /output devices. Assume port A and C are connected to data entry devices and port B is connected to printer device. Assume the input /output features in mode 0 and 8 total address lines for microprocessor address bus .Identify the following:

1- port addresses in the figure[A,B,AND C] [1M]
2- port address for control register [1M]
3- Control word [1M]
4- Write a program to read from port A and C and print out on port B **[2M]**



BITS,PILANI-DUBAI CAMPUS
Academic City, Dubai
Year II – semester II - [All Sections] 2007-2008
Test 2 [open Book]

Course No. ES UC 263 Course Title : Microprocessor
Date : April 20,2008 Time 50 minutes weightage: 15%

Note: 1.Answer all questions sequentially
2.Marks are shown in the brackets against each question.

1 .What happens if AH= 02H and DL= 47H ,when INT 21H instruction is executed.[1]

2. Load the data byte A8 H in register C . Mask the high order bits (D7- D4) and display the low order bits (D3- D0). [1]

3. The following instruction subtracts two unsigned numbers. Specify the contents of register A and the status of the S and CY flags. Explain the significance of the sign flag if it is set.
MVI A, F8H
SUI 69 H
[1]

4. Specify the contents of accumulator when the following instructions are executed. .[1]

MVI A,C5H
ORA A
RAL
RRC

5. Develop a sequence of instructions to multiply the number 9 by 16 without using MUL instruction. [1]

6.Write a procedure to a)exchange the contents of two arrays LIST1 and LIST2 by making use of a temporary array.
b) Count the number of 0's in LIST1 and store it in BX and to count the number of 0's in LIST2 and store it in CX.
[1X2 = 2]

7. Write a program to load 150 words of data into array INPUT with the output generated by a square wave form generator which is connected at port address 7A3CH. [1]

8. Is this a valid instruction MOV CL,CS justify your answer. [0.5]

9. Give the opcode for the instruction MOV ECX,[EBX+2 x ESI].Explain the significance of each bit. [1.5]

10. what is the difference between macro and procedure? [1]

11. Show what assembly language instructions are generated by the following sequence:

```
MOV DH,20H
ADD AL,DH
.IF AL <=50 || DL ==10H
    ADD AL,DL
.ENDIF
```
[1]

12. write a procedure that multiplies DI by SI and then divides the result by 100H.Make sure that the result is left in AX upon returning from PROCEDURE.This procedure may not change any register except AX. [1]

13.if vector number is given as 20 show how you can calculate the starting address of the interrupt instruction INT 20 .show how many bytes long does this instruction take as an op code and mention the purpose of that interrupt. [1]

14.Use BIOS INT 10H to develop a MACRO that positions the cursor at line6 and column 9. Assume text mode operation of VGA . [1]

BITS,PILANI-DUBAI CAMPUS
Academic City, Dubai
Year II – semester II - [All Sections] 2007-2008
Test 1 [Closed Book]

Course No. ES UC 263 Course Title : Microprocessor
Date : March 2,2008 Time 50 minutes weightage: 20%

Note: 1.Answer all questions [Sequentially]
2.Marks are shown in the brackets against each question.

Show the block diagram of a computer system showing the buses clearly [2]

2. Give the full notation of the following abbreviations (only complete notations will be awarded marks)
   a. TPA
   b. EISA
   c. CICS
   [1.5]

3. List the important features of the Pentium4 processor with reference to
   a. Cache size
   b. Material used in circuitry
   c. Bus speed [1.5]

4. a. Shift is an example of a _____ operation. [1]

   b. A kilo byte consists of _____ bytes.

5.In the real mode, show the starting and ending addresses of each segment located by the following segment register values.
a) E000 H b) AB00 H [1]

6.Determine the memory locations addressed by the following real mode 8086 register combination.
   a) DS = 2000 H and AX =3000
   b) SS = 8000 H and SP =9000 H [2]

7. What are the advantages of segment and memory addressing scheme? [1]

8. What are the default offset registers for code segment and stack segment? [1]

9.What is the maximum value the offset register can hold and why? [1]

10. what is the wrong with **MOV BL,CX** instruction? [0.5]

11.-What is the purpose of the following statements [2.5]
```
.MODEL TINY
.START UP
```

```
.MODEL SMALL
.CODE
.EXIT
```

12- In the instruction **MOV [AX],1001 H** assembler cannot determine the size of 1001 H .How will you modify the instruction so that it is unambiguous. [0.5]

13- what is the difference between Intersegment and Intrasegment ? [1.5]

14- Develop a data structure that has 3 fields of one word each named : **NAME,ADDRESS, MOBILE**. With a structure name of **DETAILS** .Show how the field **MOBILE** is Addressed in the program

[1]

15-Form a JUMP instruction that jumps to the address pointed to by BX register. [0.5]

16- how many bytes are stored on the stack by PUSH AX. [1]

17- Suppose that DS=1000 H , SS= 2000H , BP= 1000H , DI=0100H.Determine the memory address accessed by each of the following instructions assuming real mode operation

a- MOV CX,[DI] .
b- MOV EDX,[BP] [1]

Good Luck