东 南 大 学 考 试 卷（样卷）

课程名称 计算机输入输出系统 考试学期 XX-XX-X 得分

适用专业 软件工程 考试形式 开卷 考试时间长度 120 分钟

可带物品包括：上课的课件打印稿、自己的课堂笔记、一本参考书、计算器、文具

自觉遵守考场纪律 如考试作弊 此答卷无效

姓名 学号

密 封 线

一、 Answer the following questions in Chinese or in English (30 point)

1. Suppose a data is 76FCH in Hexadecimal, how to place it from the address that 20000H by little endian and big endian?（6 point）
2. Suppose DS=1100H, DI=0002H, BX=0500H, DS:[0502H]=0FDH, DS:[0503H]=47H，(AX) = 3A0FH。(8 point)

   (1) What is the begin physical address and the end physical address of data segment which DS indicate。

   (2) After MOV AL, [BX+DI] execute，AX=? Which physical address does this instruction access?.
3. Which instruction can make RD# valid and M/IO# is logic 0? Which instruction can make RD# valid and M/IO# is logic 1? (4 point)
4. Which mode in 8254 can triggered by hardware? which mode in 8254 cann't count periodically?（4 point）
5. How many way of techniques to determines the priority of multiple interrupt? What are them and how them work? Which way dose X86 do? （8 point）

二、Programming（40 Points）

1. Suppose the data declared as follow:（8 point）

```
ORG 100H
NUM1   WORD   0AB13H,27H,$+3
ORG $+2
NUM3   BYTE   0AH, 0DH
```

   Question: How do the data store in memory? Please draw the memory map

2. Choose four different instructions to accomplish AX=0.（4 point）
3. What’s the different between the IRET and RET instruction?(3 point)
4. What’s the function of the following instruction sequence?（6 point）

```
.DATA
        A   BYTE   10,20,3,55,68,12,7,8,33,100
        B   BYTE   10 DUP(?)
.CODE
START: MOV   AX, @DATA
        MOV   DS, AX
        LEA   SI, A
        LEA   DI, B
        ADD   DI, 9
        MOV   CX, 10
    LP:  CLD
        LODSB
        STD
        STOSB
        DEC   CX
        JNZ    LP
        MOV   AX,4C00H
        INT    21H
END START
```

5. Programming instruction sequence in 16-bit assembly language:
    1) Set the bit 7, bit 2 and bit 0 of AL to 1，the other bits has no change. (2 point)
    2) Use shift instruction to calculate AX=AX*6+BX*30， suppose the data are assigned and no carry.（8 point）
    3) Use string instruction to move 200 bytes data which begin address is 4000H:0000H to the area that begin address is 4000H:0001H（9 point）

三、Analysis and design（30 points）

1. Use a 8254 to generate a 1ms pulse every 99ms，System provides a 1MHz standard clock. The address of 8254 is 190H，192H，194H，196H。

   1）Please draw the decoding circuit with 74LS138 as the decoder. Suppose $CS\#_{8254}$ connected to Y2#.（4 point）

   2）Draw the circuit show how to connect 8254 pins that can obtain correct results (including A0, A1 and CLK, GATE and OUT)（4 point）

   3）Programming the instruct sequence to initialize the 8254.（4 point）

2. An interface system include 8254, 8259 and 8255, PA of 8255 connected 8 light-emitting diodes(L_7~L_0), if PA_i=1, then L_i bright，else L_i extinguish. At beginning PA7~PA0=00000001B. System interrupt CPU every 1s, in the interrupt handling, control the LED bright one by one as order as L_0-L_1-L_2-L_3-L_4-L_5-L_6-L_7-L_0-L_1-…… (when interrupt come, change to next LED bright) . System provides the standard clock is 2KHz.

Suppose the port address of 8254, 8259and 8255 is the same as the PC：

1) Finish the circuit shown as figure 1 (Decode is not need to draw).（3 point）

2）Depending on your circuit, programming in 16-bit assembly language to initial 8255 and 8259 (8259 in normal EOI ; non buffered mode; level triggered mode).（7 point）

3）Depending on your circuit, programming the interrupt-handling routine and the interrupt vector initial program.（8 point）

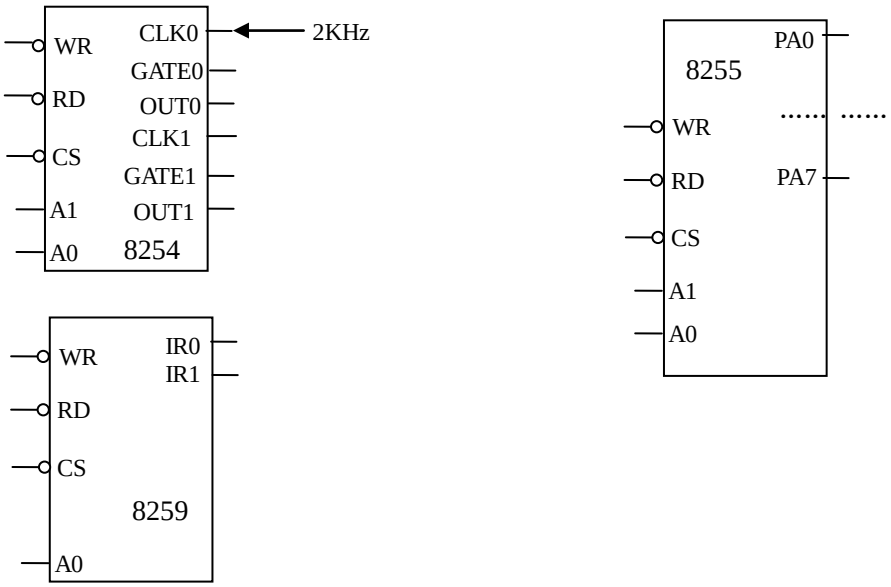
WR
RD
CS
A1
A0
8254
CLK0
GATE0
OUT0
CLK1
GATE1
OUT1
2KHz
WR
RD
CS
A0
8259
IR0
IR1
8255
WR
RD
CS
A1
A0
PA0
PA7

Figure 1