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| --- | --- | --- |
| **Cairo University** | **CMPN201** | **Total:80 Points** |
| **Faculty of Engineering** | **Microprocessor Systems** | **2018-2019** |
| **Computer Eng. Department** | **Final Exam**  | **Two Hour** |

**This is an open-book, open notes exam. All electronic devices - Except calculators - are forbidden.
Make any reasonable assumptions (if necessary)
Answer the following questions**

**Q1 – A - [6] Indicate if the statement is True or False by writing TR or FL**

|  |  |
| --- | --- |
| Null Modem Connection could be used with large distances as a cheaper alternative |  |
| The default value for procedure definition is NEAR |  |
| Parallel communication is used for small distances only |  |
| The start bit is one or two zero bits. |  |
| The CMP instruction alters the contents of its operands |  |
| For very large distances, it is recommended to use High parity (sticky) over Low parity (sticky) |  |

**Q1 – B - [4] Choose Simplex , Half Duplex or Full Duplex for each of the following devices by putting (√) under your choice**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Simplex** | **Half Duplex** | **Full Duplex** |
| 1. Land line telephone
 |  |  |  |
| 1. Printer
 |  |  |  |
| 1. Satellite receiver
 |  |  |  |
| 1. Internet cables
 |  |  |  |

**Q1 – C - [5] What does the following abbreviations stands for:**

|  |  |
| --- | --- |
| **BIU** |  |
| **EU** |  |
| **ALU** |  |
| **IP** |  |
| **CS** |  |

**Q2 – A - [21] Trace the following conde to find flags values after each command. Assume that flags values initially are SF=0,CF=1, PF=0, AC=0, OF=0 and ZF=0 and all registers are 0**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **SF** | **CF** | **PF** | **AC** | **OF** | **ZF** |
|  | **0** | **1** | **0** | **0** | **0** | **0** |
| MOV BL, 6 |  |  |  |  |  |  |
| ADC AX, BX |  |  |  |  |  |  |
| ADD BH,AL |  |  |  |  |  |  |
| ADD AX,2424H |  |  |  |  |  |  |
| SUB BX,2020H |  |  |  |  |  |  |
| SBB CX,BX |  |  |  |  |  |  |
| MUL BL |  |  |  |  |  |  |

 **Q2 – B - [6] Complete the following statements**

Increasing hard disk speed increases ………………………..memory speed

Computer buses are unidirectional like ………………….. bus or bidirectional like …………………bus

For CS=AAAA and IP = BBBB the physical address of the current command is ………………………

The overflow flag after adding AL= 0DAH to BL = 45H equal ………………………………

The maximum number of addressable locations for 42 bits address bus is …………………………….

**Q2 – C - [20] Write a single instruction for each of the following operations. Note that no other changes should occur.** **(With default flags)**

|  |
| --- |
| increase SI by one using four methods |
|  |  |
|  |  |
| invert bits 2,4,6 of AX |
|  |
| Clear the lower nibble of cl |
|  |
| Multiply by two ( using two methods) |
|  |  |
| Change the parity of DX |
|  |  |

**Q3 –A - [10] XYZ corporation communication system uses full duplex communication to transfer data between departments. The communication system designer decided to convert this system to two half duplex channels instead of one for sending and the other for receiving to increase transmission speed.**

**State two drawbacks for this decision**

1. ……………………………………………………………………………………………………….
2. ……………………………………………………………………………………………………….

 **Q3 – B – [3] State the usage of each of the following commands**

|  |  |
| --- | --- |
| INC |  |
| MOV |  |
| ADD |  |

**Q4 – A - [20] What is the output of each of the following programs**

|  |  |
| --- | --- |
| .model small.codemain proc far mov ax, 13h int 10h mov ax,0c0fhmov cx, 20mov dx, 10c:int 10hloop cmov cx,20inc dxcmp dx,30JNE cendp mainend main | .model small.dataX dw 7Y dw 9 .codemain proc far mov ax,@datamov ds,axMOV AX,XMOV BX,YS:MOV DX,0MOV CX,BXDIV BXMOV BX,DXMOV AX,CXCMP BX,0JNE SMOV CX,AXMOV AX,XMOV BX,YMUL BXDIV CXendp mainend main |
|  |  |

**Q4 – B - For the following program**

|  |  |  |  |
| --- | --- | --- | --- |
| .model small.codemain proc far shl bl,8 mov al,'A'mov cl,alpush axadd bl,al | inc blmov dl,bladd dl, 12h mov ah,2int 21hsub dl,ahint 21hsub dl,cl | inc dlshr ax,8xor dh,dhxchg dx,axdiv dl mov dl,al add dl,cldec dl | mov ah,2int 21h add dl,ahint 21h pop dx int 21h endp mainend main |

**[10] What is the output of the program?**

**[5] Make only one modification to change output letters case (Lower/Upper)**

**Changed line from to**