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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  .code  main proc far  mov ax, 13h  int 10h  mov ax,0c0fh  mov cx, 20  mov dx, 10  c:int 10h  loop c  mov cx,20  inc dx  cmp dx,30  JNE c  endp main  end main | .model small  .data  X dw 7  Y dw 9  .code  main proc far  mov ax,@data  mov ds,ax  MOV AX,X  MOV BX,Y  S:MOV DX,0  MOV CX,BX  DIV BX  MOV BX,DX  MOV AX,CX  CMP BX,0  JNE S  MOV CX,AX  MOV AX,X  MOV BX,Y  MUL BX  DIV CX  endp main  end main |
|  |  |

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

|  |  |  |  |
| --- | --- | --- | --- |
| .model small  .code  main proc far  shl bl,8  mov al,'A'  mov cl,al  push ax  add bl,al | inc bl  mov dl,bl  add dl, 12h  mov ah,2  int 21h  sub dl,ah  int 21h  sub dl,cl | inc dl  shr ax,8  xor dh,dh  xchg dx,ax  div dl  mov dl,al  add dl,cl  dec dl | mov ah,2  int 21h  add dl,ah  int 21h  pop dx  int 21h  endp main  end 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**