1. Given 8­bit floating­point binary format: 1 (sign) + 3 (exponent) + 4 (mantissa).Convert the 8­bit floating point number 57 (in hex) to decima

**DA : 5,75**

1. A system programmer needs to divide ­6247 by 300 (decimal)

**DA : MOV AX,E799; CDW; CDW; IDIV BX; IDIV BX; FF09**

1. Write mask byte (in hex) to clear the lower 4 bit of a byte value with AND instruction

**DA : F0**

1. To isolate one or more bits in a byte value, use **\_\_\_\_\_\_\_\_AND**\_\_ instruction.
2. EAX now stored a 32­bit IP address of a host. The network ID (netID) is 20 bit and can be  
   extracted from IP byte anding with a 32­bit mask. Write correct instruction to extract netID from  
   EAX register

**DA : and EAX,FFFFF000**

1. The following sequence of instructions are executed. What is the correct values at watch point?  
   MOV AX, 67FE  
   MOV BX, AX   
   MOV CL, BH **DA : FE67, 67FE**  
   MOV CH, BL
2. The following sequence of instructions are executed. What is the correct value of flag bits at watch  
   point?  
   MOV EAX, 12AE **DA : set, reset, set**  
   SUB EAX, 12AF
3. Physical address of the stack pointer is 2DA82, stack segment located at 1DAE. Computer the value of SP register? **DA: FFA2**
4. Match the following hexadecimal numbers to octal

**DA:347, 156, 251**

1. Enter debug command to fill 256 bytes in data segment starting from 100 with value 0D  
    **DA : f 100 1FF 0D**
2. Given 8­bit floating­point binary format: 1 (sign) + 3 (exponent) + 4 (mantissa).Convert the 8­bit floating point number E7 (in hex) to decimal

**DA : -11,5**

1. Match the correct answer for binary operations on the left  
   **DA:**

**1111111 ­ 111 1111000  
1100111 ­ 111 1100000**

**1010101 + 10101 1101010  
1010110 ­ 101 1010001  
1110011 + 11001 10001100  
1111111 + 11111 10011110**

1. Convert the following binary numbers to hexadecimal  
   **DA:**

**10101001 A9  
01101110 6E  
11100101 E5  
11100111 E7**

1. The following sequence of instructions are executed. What is the correct value of CF and OF at  
   watch point?  
   MOV AX,140h  
   MOV CX,8h   
   MUL CX  
   watch point:  
    **DA: CF= reset  
    OF= reset**
2. To test one bit in a byte value without destructing the byte, use **\_\_\_TEST\_\_\_** instruction.
3. Given a row of memory image in debug  
   **0AE8:0120 13 96 D0 E0 D0 E0 A2 1E ­ 99 80 3E 20 99 00 75 24  
   Initially, AX=BX=CX=DX=0, SI=121**.What are value of CX,DX after execution of the following instructions?  
   MOV DX, [SI]  
   MOV CX, [SI+2]  
    **DA: DX = D096  
    CX = D0E0**
4. Select correct match for register values at watch points:  
   MOV AX, 152D  
   ADD AX, 003F  
   watch point #1: **DA : AH = 25**  
   ADD AH, 10  
   watch point #2**: DA: AL = 6C**
5. A memory location located in extra segment which now has value of 564F. This memory managed  
   by ES:SI register­pair. SI now points to 905F. Compute the physical address of this memory  
   location  
    **DA: 5F54F**
6. Select correct match for AL and carry flag at watch point #1:  
   MOV BL, 8C  
   MOV AL, 7E  
   ADD AL, BL  
   watch point #1:  
   DA:  
    **Carry flag set  
    AL 0A**
7. Convert the 32­bit floating point number C4361000 (in hex) to decimal.  
   **DA: ­728,25**
8. Which of the following instructions are not legal addressing?

**DA : MOV AX, [BX+SP]  
 MOV AX, [SP+1]**

1. Compute the physical address of stack top if stack pointer is FFAE and stack segment located at 1DAE  
   **DA: 2DA8E**
2. Sign­extend number 1011 0101 (8­bit binary) to 16­bit  
   **DA: 1111111110110101**
3. The following sequence of instructions are executed. What is the correct value of AX, CX, DX at watch point?  
   MOV AX,30  
   MOV CX,FFFF  
   MUL CX  
   watch point:  
    **DA: CX = FFFF  
    AX = FFD0  
    DX 002F**
4. Consider the following assembly instruction sequence  
   CMP DL, 0  
   JB x\_label  
   CMP DL, 9  
   JA a\_label  
   ADD DL, 30h  
   JMP x\_label  
   a\_label:  
   CMP DL, 0Fh  
   JA x\_label  
   ADD DL, 31h  
   x\_label:  
   MOV AL, DL  
   watch point:  
   Choose correct value of AL register at watch point for different value of DL?  
    **DA : DL=55h 85h  
    DL=0FFh 41h  
    DL=10 38h  
    DL=8 0FFh**
5. Select correct match for AX (Decimal) at watch points:  
   MOV AX, 1BC  
   MOV CL, 2  
   SHL AX, CL  
   watch point #1**: DA: 1064**ADD AX, 166  
   watch point #2**: DA: 266**SHR AX, CL  
   watch point #3: **DA: 266**  
   SHR AX, CL
6. if the location to which the control is to be transferred lies in a segment other  
   than the current one, then the jump instruction is called

**DA: intersegment mode**

1. Structural components of computer include:  
   **DA: System interconnection  
    Central processing unit  
    I/O  
    Memory**
2. Which could be correct ones for the destination operand in a data movement  
   instruction?  
   **DA: register  
    memory location**
3. the instruction, JMP C008:2000h is an example of  
    **DA: near jump**

**far jump**

1. Given a row of memory image in debug  
   0AE8:0120 13 96 D0 E0 00 40 08 42 - 99 80 3E 20 99 00 75 24  
   SI = 120  
   The following instruction is executed:  
   MOV EAX, [SI+4]  
   Assume the value in EAX is a 32-bit floating-point binary, what is the value of  
   EAX in decimal?  
   **DA: 4000**
2. Given a code snippet:  
   int n = 10;  
   do {  
   n--;  
   } while (n > 0);  
   Which ones are the equivalent logic sequence of instructions in Assembly  
   DA**: mov cx, 10  
    a\_label:  
    .....  
    loop a\_label**

**mov cx, 10  
a\_label:  
dec cx  
cmp cx, 0  
jz e\_label  
jmp a\_label  
e\_label**:

1. The following sequence of instructions are executed. What is the correct  
   value of AX, CX, DX at watch point?  
   MOV AX,30  
   MOV CX,FFFF  
   MUL CX  
   watch point:  
   **DA: CX = FFFF  
    AX = FFD0  
    DX 002F**
2. After executing PUSH EAX instruction, the stack pointer  
   **DA: decrements by 4**
3. the instruction that is used as prefix to an instruction to execute it repeatedly  
   until the CX register becomes zero is

**DA: REP**

1. Write mask byte (in hex) to clear all the lower 7 bits of a byte value with AND  
   instruction.  
   **DA: AND AL, 01111111B**
2. The instruction that subtracts 1 from the contents of the specified register/memory location is  
   **DA: DEC**
3. What is the meaning of Amdahl's law in processor performance evaluation?   
   **DA: the maximum speedup of a multicore processor**
4. Which are the correct actions for LODSW string operation if DF is reset (=0)  
   **DA: increase SI by 2  
    Load 16-bit value at memory location pointed by DS:[SI] into AX**
5. the instruction, CMP to compare source and destination operands by

**DA: subtracting**

1. To balance the super speed of CPU with the slow response of memory, which  
   of the following measures have been made by engineers in system design?  
   **DA: Make wider data bus path  
    Using higher-speed bus and us hierarchy  
    To move data directly by DMA**
2. The following sequence of instructions are executed. What is the correct  
   value of AX, DX at watch point?  
   MOV DL,FF  
   MOV AL,42  
   IMUL DL  
   **DA: AX = FFBE  
    DX=0000**
3. In the RCR instruction, the contents of the destination operand undergoes function as  
   **DA: carry flag is pushed into MSB then LSB is pushed into carry flag**
4. Which could be correct ones for the source operand in an instruction?  
   **DA: immediate data**  
    **memory location  
    register**
5. Convert the 32-bit floating point number A3358000 (in hex) to decimal

**DA: -9.83913471531×10^-18**

1. Select correct match for register values at watch points:  
   MOV AX, 152D  
   ADD AX, 003F  
   watch point #1**: DA: AH = 25**  
   ADD AH, 10  
   watch point #2: **DA: AL = 6C**
2. Which are the correct actions for SCASW string operation if DF is set (=1)  
   **DA: Decrease DI by 2  
    Dompare the value in AX register with 16-bit value at the memory location  
    Pointed by ES:[DI] and set/clear flag bits accordingly**
3. What is the correct value of SI, AL (in hex) at watch point:  
   01: MOV SI, 300h  
   02: MOV AL, 10h  
   03: MOV CX, 7  
   04: Loop\_label:  
   05: MOV [SI], AL  
   06: ADD AL,10h  
   07: INC SI  
   08: LOOP Loop\_label  
   **DA: SI = 80h  
    AL = 80h**
4. Select the correct sequence of instructions to compute -1024/128 (all values  
   are in hex).  
   **DA: Step 1: CWD  
    Step 2: MOV CX,80  
    Step 3: MOV CL,80  
    Step 4: IDIV CL**
5. Select correct match for AL and carry flag at watch point #1:  
   MOV BL, 8C  
   MOV AL, 7E  
   ADD AL, BL  
   watch point #1:  
   **DA: AL 0A  
    Carry flag set**
6. After executing the POP EAX instruction, the stack pointer  
   **DA: After executing the POP EAX instruction, the stack pointer**
7. Sign-extend number BF (8-bit binary) to 16-bit. Write result in hex  
   **DA: 191**
8. Which of the following instructions are not valid?  
   **DA: MOV DS, B800h  
    MOV SP, SS:[SI+2]**
9. The following sequence of instructions are executed. What is the correct  
   value of flag bits at watch point?  
   MOV AL, 0F  
   ADD AL, F1  
   watch point:  
   **DA: Zero flag (OF) = reset  
    Carry flag (CF) = set**
10. Major structural components of the CPU include:  
    Select one or more:  
    **DA: Registers  
     Arithmetic and Logic Unit**

**Interconnections  
 Control Unit**

1. Consider a magnetic disk drive with 8 surfaces, 512 tracks per surface, and 64  
   sectors per track. Sector size is 1 kB. What is the disk capacity  
   **DA: 512 KB**
2. What best describe the Spatial and Temporal Locality?

DA:

**Temporal locality : be exploited by keeping recently used instruction and data in cache memory and by exploiting a cache hierarchy**

**Spatial locality : be exploited by moving data between cache and memory more efficient**

1. Given a code snippet:  
   int ax, bx;  
   ...  
   if (ax >= bx)  
   ax -=bx;  
   else  
   bx -=ax;  
   What is the equivalent logic sequence of instructions in Assembly  
   Select one:  
   **DA: cmp ax,bx  
    jl a\_label  
    sub ax,bx  
    jmp x\_label  
    a\_label:  
    sub bx,ax  
    x\_label:**
2. Which of the following is not a data copy/transfer instruction?  
   Select one or more:

**DA: ADC  
 DAS**

1. Consider the following assembly instruction sequence  
   CMP DL, 0  
   JB x\_label  
   CMP DL, 9  
   JA a\_label  
   ADD DL, 30h  
   JMP x\_label  
   a\_label:  
   CMP DL, 0Fh  
   JA x\_label  
   ADD DL, 37h  
   x\_label:  
   MOV AL, DL  
   watch point:

Choose correct value of AL register at watch point for different value of DL?  
**DA: DL=10 38h  
 DL=8 41h  
 DL=55h 55h  
 DL=0FFh 0FFh**

1. The following sequence of instructions are executed. What is the correct value of CF and  
   OF at watch point?  
   MOV AX,FFF6h  
   MOV CX,1000h  
   IMUL CX  
   watch point:  
   **DA: OF= set  
    CF= undefined**
2. Which could be correct ones  
   Select one or more:  
   **DA: register**

**memory location**

1. Write mask byte (in hex) to clear bit 2nd, 3rd, 5th of a byte value with AND instruction (LSB is 1st bit).  
   **DA: 1001011**
2. if the location to which the control is to be transferred lies in a segment other than the  
   current one, then the jump instruction is call  
   **DA: intrasegment direct mode**
3. Convert the 32-bit floating point number 44363800 (in hex) to decimal.  
   **DA: 1144403968**
4. The following sequence of instructions are executed. What is the correct value of flag bits at  
   watch point?  
   MOV AX,FFFF  
   MOV CX,5  
   MUL CX  
   watch point:  
   **DA: Carry flag (CF) = set  
    Overflow flag (OF) = not defined**
5. In multiplication instruction, when the source operand is 16 bit, how can the result be taken?

**DA: from DX:AX pair**

1. Given a row of memory image in debug  
   0AE8:0120 13 96 D0 E0 D0 E0 A2 1E - 99 80 3E 20 99 00 75 24  
   Initially, AX=BX=CX=DX=0, SI=128  
   What are value of AX,DX after execution of the following instructions?  
   MOV EDX, [SI]  
   MOV EAX, [SI+4]  
   **DA: DX = 203E  
    AX = 8099**
2. Which statements are correct for HDDs?  
   Select one or more:  
   **DA: Head, Track, Sector are key parameters for access data on hard disk  
    Bits are stored on tracks**
3. Which are correct action for SCASW string operation if DF is set (=1)

**DA: compare value in AL register with memory location pointed by ES:[DI]  
 Increase DI by 2**

1. Given a row of memory image in debug  
   0AE8:0120 13 96 D0 E0 D0 E0 A2 1E - 99 80 3E 20 99 00 75 24  
   SI = 120, DI = 128  
   Select correct sequence of instructions to subtract words at [DI] from [SI] then store the  
   result at memory location 12A  
   **DA: Step 1: MOV AX, [SI]  
    Step 2: SUB AX, [DI]  
    Step 3: SUB AX, [SI]  
    Step 4: MOV BX, 012A**
2. The instruction that supports addition when carry exists is

**DA: ADC**

1. In computer, how does the processor serve multiple interrupt request from devices?  
   Select one:  
   **DA: Each device are assigned an interrupt priority, the device with lower priority will be served.**
2. The following sequence of instructions are executed. What is the correct value of flag bits at  
   watch point?  
   MOV AL, 80  
   MOV BL, 2  
   MUL BL  
   watch point:  
   **DA: Overflow flag (OF) = reset  
    Carry flag (CF) = set**
3. To test one bit in a byte value without destructing the byte, use **\_\_\_\_NOT\_\_\_\_\_\_** instruction.
4. Which are correct about the data registers o  
   Select one or more:  
   **DA: Complete 32-bit registers: EAX, EBX, EC  
    Higher halves of the 32-bit registers can EAH, EAL, EBH, EBL, ECH, ECL, EDH, EDL.**
5. The following sequence of instructions are executed. What is the correct value of flag bits at  
   watch point?  
   MOV DL,FF  
   MOV AL,F6  
   IMUL DL  
   watch point:  
   **DA: OF = set  
    CF = set**
6. Choose correct features for SRAM and DRAM  
   **DA:**

**SRAM: Faster access time, cost more per bit, smaller size**

**DRAM: Slower access time, cheaper cost per bit, can manufacture with larger size**

1. The following sequence of instructions are executed. What is the correct value of flag bits at watch point?  
   MOV AL, 0F  
   ADD AL, F1  
   watch point:  
   **DA: Zero flag (OF) = set  
    Carry flag (CF) = neither set nor reset**
2. Which are correct action for STOSB string operation if DF is reset (=0)

**DA: Store 8-bit value from AL into memory location pointed by DS:[SI]  
 Increase DI by 1**

1. What are components of Von Neumann, namely IAS computer?

**DA: I/O Equipments**

**CPU**

**Memory**

1. Which set of registers are valid for addressing a stack memory location?  
   Select one or more:  
    **DA: SS:BX  
    DS:SI**
2. The instruction that is used for finding out the codes in case of code conversion problems is

**DA: XCHG**

1. To clear one or more bits in a byte value, use **\_\_AND\_\_\_\_\_\_\_\_** in
2. The following sequence of instructions are executed. What is the correct value of flag bits at  
   watch point?  
   MOV AL,-5  
   SUB AL,124  
   watch point:  
   **DA: Zero flag (OF) = not defined  
    Overflow flag (OF) = reset  
    Sign flag (SF) set  
    Carry flag (CF) = set**
3. Enter debug command to fill 256 bytes in data segment starting from 100 with value 0D  
   **DA: ADD 0D, 256[100]**
4. Which are correct action for LODSB string operation if DF is reset (=0)

**DA: Load 8-bit value at memory location pointed by ES:[DI] into AL**

**Decrease DI by 1**

1. Given a code snippet:  
   int n = 10;  
   do {  
   n--;  
   } while (n > 0);  
   Which ones are the equivalent logic sequence of instructions in Assembly

**DA: mov cx, 10  
 a\_label:  
 .....  
 dec cx  
 loop a\_label**

1. For better speed, in CPU design, engineers make use of the following techniques:

**DA: Pipelining**

1. In multiplication instruction, when the source operand is 8 bit, \_\_\_\_\_\_\_\_\_ will be multiplied  
   with source.  
   **DA: Whatever general purpose register**
2. Which are valid based index addressing?

**DA: [BX+DI]  
 [DX+SI]**

1. Memory dump at 1D20  
   1D20:0200 00 20 10 5  
   Given value of register  
   Identify correct value o  
   **DA: AH = 5Dh  
    AL = 10h**
2. Given a code snippet (ax, bx are none negative integers):  
   if (ax >= bx)  
   ax -=bx;  
   else  
   bx -=ax;  
   What is the equivalent logic sequence of instructions in Assembly

**DA:**

**cmp ax,bx  
 ja a\_label  
 sub ax,bx  
 jmp x\_label  
 a\_label:  
 sub bx,ax  
 x\_label:**

1. The instruction, MOV AX, 0005h belongs to which addressing mode?

**DA: direct**

1. Which of the following instructions are not valid?

**DA: MOV DS, B800h  
 MOV SP, SS:[SI+2]**

1. The following sequence of instructions are executed. What is the correct value of flag bits at watch point?

MOV DL,FF

MOV AL,F6 **ĐA: OF = reset , CF = reset**

IMUL DL

1. In multiplication instruction, when the source operand is 16 bit, how can the result be taken?

**ĐA: from AX**

1. Consider the following assembly instruction sequence

CMP DL, 0

JB x\_label

CMP DL, 9 JA a\_label ADD DL, 30h

**Choose... ĐA: DL=10**

JMP x\_label

**Choose...**  **ĐA**: **DL=8**

a\_label:

**Choose... ĐA: DL=55h**

CMP DL, 0Fh

**Choose...** **ĐA: DL=0FFh**

JA x\_label

ADD DL, 37h

x\_label: MOV AL, DL watch point: ...

Choose correct value of AL register at watch point for different value of DL?

1. Hereafter is instruction sequence to compute the sum of 8 bytes starting at memory address 200. Two lines of code are possibly missing. Choose correct one to fill in?

01: **\_\_\_ MOV [SI],200\_\_\_;** possibly missing code

02: MOV AL, 0

03: MOV CX, 8

04: Loop\_label:

05: \_ **\_CWD\_\_;** possibly missing code

06: ADD AX, [SI];

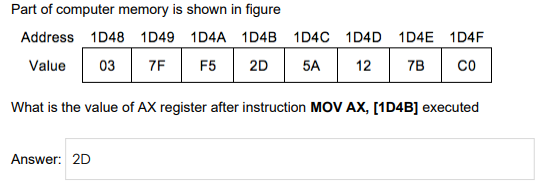
07: INC SI

08: LOOP Loop\_label

1. In multiplication instruction, when the source operand is 8 bit, **\_\_AL\_\_** will be multiplied with source.
2. Which are valid based index addressing?

**ĐA: [BX+DI], [DX+SI], [BX+SI**]

1. **2D**



1. The following sequence of instructions are executed. What is the correct value of AX, CX, DX at watch point? MOV AX,0020 MOV CX,0010 MUL CL watch point:

**ĐA: AX = 020F, DX 0000, CX = 00FF**

1. Which set of registers are valid for addressing a stack memory location? **SS:SP, SS:BP**
2. In computer, how does the processor serve multiple interrupt request from devices?

**Each device are assigned an interrupt priority, the device with higher priority will be served.**

1. Given a row of memory image in debug 0AE8:0120 13 96 D0 E0 D0 E0 A2 1E - 99 80 3E 20 99 00 75 24. Initially, AX=BX=CX=DX=0, SI=128. What are value of AX,DX after execution of the following instructions? MOV EDX, [SI] MOV EAX, [SI+4]

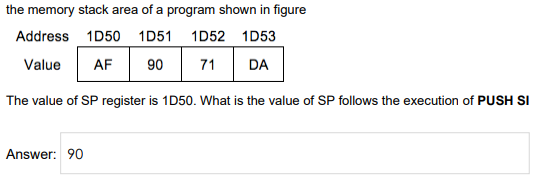
**AX = 203E DX = 8099**

1. Basic functions that a computer can perform including:

**Data movement, Control, Data processing, Data storage**

1. The following sequence of instructions are executed. What is the correct value of flag bits at watch point? MOV AX,FFFF MOV CX,5 MUL CX watch point:

**Overflow flag (OF) = reset , Carry flag (CF) = reset**



1. To clear one or more bits in a byte value, use \_\_\_**AND**\_\_\_ instruction.
2. The instruction*,* MOV AX, 0005hbelongs to which addressing mode? **Immediate**
3. Which are correct about the data registers of IA-32 processors:

**complete 32-bit registers: EAX, EBX, ECX, EDX**

1. The following sequence of instructions are executed. What is the correct value of flag bits at watch point? MOV AL,-5 SUB AL,124 watch point:

**Overflow flag (OF) = set, Carry flag (CF) = set, Zero flag (OF) = reset, Sign flag (SF) set**

1. Enter debug command to fill 256 bytes in data segment starting from 100 with value 0D:

**F 100 1FF 0D**

1. For better speed, in CPU design, engineers make use of the following techniques:

**Pipelining, Branch prediction, Speculative execution**

1. The following sequence of instructions are executed. What is the correct value of CF and OF at watch point? MOV AX,FFF6h MOV CX,1000h IMUL CX watch point:

**CF= reset , OF= reset**

1. Which are correct action for SCASW string operation if DF is set (=1)

**compare value in AL register with memory location pointed by ES:[DI], increase DI by 2**

1. Given a row of memory image in debug

0AE8:0120 13 96 D0 E0 D0 E0 A2 1E - 99 80 3E 20 99 00 75 24 SI = 120, DI = 128

Select correct sequence of instructions to subtract words at [DI] from [SI] then store the result at memory location 12A

**Step 1: MOV AX, [SI] Step 2: SUB AX, [DI] Step 3: MOV BX, 012A Step 4: MOV [BX], AX**

1. Select correct match for register values at watch points: MOV AX, 4FCA ADD AX, DDA9

watch point #1: ADD AH, F3 watch point #2: ......

**watch point #2: AL = 73, watch point #1: AH = 30**

1. Compute the physical address of the next instruction will be execute if instruction pointer is 091D and code segment located at 1FAF: **2040D**
2. Convert the 32-bit floating point number 44363800 (in hex) to decimal: **1144403968**
3. The following sequence of instructions are executed. What is the correct value of flag bits at watch point? MOV AL, 80 MOV BL, 2 MUL BL watch point:

**Overflow flag (OF) = reset, Carry flag (CF) = reset**

1. Which could be correct ones for the destination operand in a data movement instruction?

**all choices are correct**

1. The following sequence of instructions are executed. What is the correct value of flag bits at watch point? MOV AL, 0F ADD AL, F1 watch point:

**Carry flag (CF) = set, Zero flag (OF) = reset**

1. Memory dump at 1D20:0200 as below: 1D20:0200 00 20 10 5D 55 47 00 90 - 00 10 20 30 40 50 60 70. Given value of registers: DS = 1D20, SI = 200, BX = 202, AX = 0103 Identify correct value of AX register after XLAT instruction is executed. **AL = 10h, AH = 01h**

Which of the following instructions are not valid**? MOV AX, [BP+2], MOV DS, B800h**

1. if the location to which the control is to be transferred lies in a segment other than the current one, then the jump instruction is call**: intrasegment direct mode**
2. The instruction that supports addition when carry exists is: **ADC**
3. The instruction that is used for finding out the codes in case of code conversion problems is: **XLAT**
4. Which statements are correct for HDDs?

**Head, Track, Sector are key parameters for access data on hard disk, Bits are stored on tracks**

1. Which are correct action for LODSB string operation if DF is reset (=0)

**Load 8-bit value at memory location pointed by ES:[DI] into AL, decrease DI by 1**

1. To test one bit in a byte value without destructing the byte, use \_\_**T EST**\_\_ instruction.
2. What is the correct sequence of instruction cycle?

**Step 5 Calculate operand address**

**Step 2 Decode Step 4 Execution**

**Step 3 Fetch operand**

**Step 1 Fetch opcode**

**Step 6 Store result**

1. Which one best describe cache hit and cache miss?

**Cache miss ratio: the number of memory accesses that CPU must retrieve from the main memory per the total number of memory accesses**

**Cache hit ratio: the number of memory accesses that the CPU can retrieve from the cache per the total number of memory accesses**

1. For cache write policies, which are often used for write­hit and write­miss

**Write­hit Write-­back, Write­miss Write-­allocate**

1. Identify the correct sequence to update a page onto a flash memory?

**Step 3: the entire block is being read from flash into RAM then request data in page is update**

**Step 1: the entire block of flash memory are erased**

**Step 2: The entire block from RAM then is written back to the flash memory**

1. Choose correct set of registers for x86 processor

Data pointer to source memory in extra segment ES**: SI**

Pointer to variable in stack SS: **BP**

Instruction pointer CS**: IP**

Data pointer in data segment DS**: BX**

1. What are components of Von Neumann, namely IAS computer?

**Memory, CPU, Bus, I/O Equipments**

1. Which is not correct about MOORE law?

**The number of transistors that could be put on a single chip was triple every year nowadays. Likely triple after 2000**

1. For better speed, in CPU design, engineers make use of the following techniques:

**Branch prediction, Pipelining, Speculative execution**

1. To balance the super speed of CPU with the slow response of memory, which of the following measures have been made by engineers in system design?

**Make wider data bus path, Make use of both on­chip and off­chip cache memory, Using higher­speed bus and us hierarchy**

1. What is the meaning of Amdahl's law in processor performance evaluation?

**the potential speedup of a program using multiple processor compared to a single processor**

1. What are the processor's instruction categories :

**Data processing, Control, Processor ­- I/O, Processor ­- Memory**

1. In computer, how does the processor serve multiple interrupt request from devices?

**Each device are assigned an interrupt priority, the device with higher priority will be served**

1. Bus is a shared transmission medium, multiple devices connect to it but only one at a time can successfully transmit. Which component in computer facilitates this operation? **Bus Arbiter**
2. When many devices of different transmission speed connect to the same bus, the overall system performance suffers. How did the design engineers resolved this: **Multiple­Bus hierarchies**
3. What are the features of direct­mapping cache organization?

**Thrash ­­> low hit ratio, Simple and inexpensive**

1. Which ones are not correct for static RAM?

**Cheaper than dynamic RAM because simpler chip controller**

**Cost per bit is lower than dynamic RAM**

1. Which one is not correct?

**EEPROM is erasable by exposing under UV**

**PROM is non­volatile memory**

**Flash memory can only be erased electrically byte by byte**

1. Which statements are correct for HDDs?

**Bits are stored on track**

**Head, Track, Sector are key parameters for access data on hard disk**

1. What is correct about the function of TRIM command in SSD?

**Allow OS to notify SSD the presence of occupied blocks of data which are no longer in use and can be erased internally**

1. Which set of registers are valid for addressing a memory location? **DS:SI, DS:BX, CS:IP**
2. Which are valid based index addressing? **[BX+SI], [BX+DI]**
3. Which are valid index addressing? **[SI]**
4. Which are correct about the data registers of IA­32 processors:

**Lower halves of the 16­registers an be used as 8­bit data registers: AH,AL,BH,BL,CH,CL,DH,DL complete 32­bit registers: EAX, EBX, ECX, EDX**

**Lower halves of the 32­registers an be used as 4 16­bit data registers: AX,BX,CX,DX**

1. Which are correct about 32 bit index registers of IA­32 processors:

**EDI: 32 bit pointer to destination memory in data movement instructions**

**DI: 16 bit pointer to destination memory in data movement instructions**

**SI: 16 bit pointer to source memory in data movement instructions**

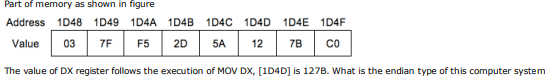
**ESI: 32 bit pointer to source memory in data movement instructions**

1. Which statement is correct about interrupt vector table?

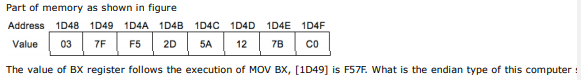
**Take up 1024 bytes in the main memory**

**Store in the beginning area of the main memory**

1. **ĐA: big-endian**



1. **ĐA: little-endian**



1. The value in CS is 1FD0h what is the location of next instruction from 00000h if Instruction pointer is 3CD4h: **3CD5H**
2. Select correct items to describe best about CISC

**Number of clocks per instruction: multi-­clock**

**code size of program: small code size**

**Assembly code: simpler**

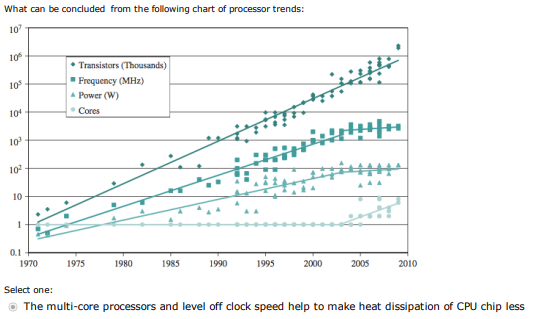
**Instruction set: Complex**

**Bytes per instruction: different for variety of instructions**

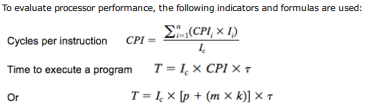
1. What best describe the Spatial and Temporal Locality?

**Temporal locality: be exploited by keeping recently used instruction and data in cache memory and by exploiting a cache hierarchy**

**Spatial locality: be exploited by using larger cache blocks and by incorporating prefetching mechanisms into the cache control logic**







**ĐA: Instruction set architecture , Compiler technology**

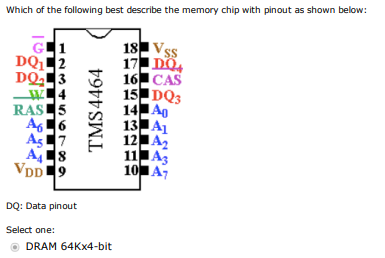
1. To evaluate processor performance, the following indicators and formulas are used: Which of the following system attributes affects cycle time τ

**Processor implementation, Cache and memory hierarchy**

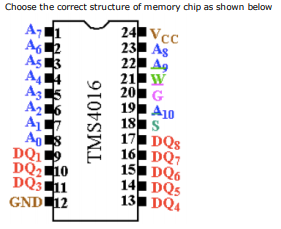
1. Key parameters to consider when evaluating processor hardware include:

**Reliability, performance, power consumption, size, cost**

1. A memory chip has 12 address pins, determine the maximum memory words of this chip? **4096**



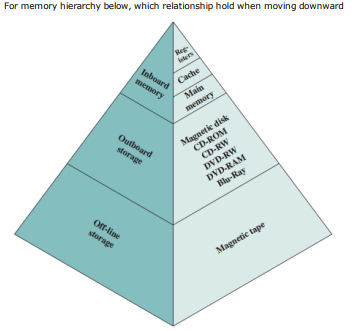
1. **SRAM 2Kx8­bit**



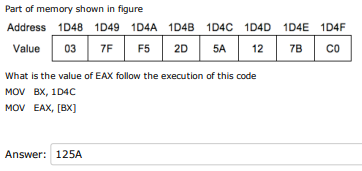
1. The three key characteristics of memory are: capacity, access time and cost. Which of the following relationships hold for a variety of memory technologies?

**Faster access time, greater cost per bit, Greater capacity, smaller cost per bit, Greater capacity, slower access time**

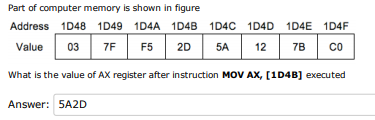
1. A SRAM memory chip labeled 32x8bit. Which of the following is correct pinout regarding address and data lines? **15 address pins, 8 data pins**
2. In the interconnection system, the number of address lines are governs by: **CPU**
3. **Increasing access time, Decreasing cost per bit, Decreasing frequency of access by the processor, Increasing capacity**

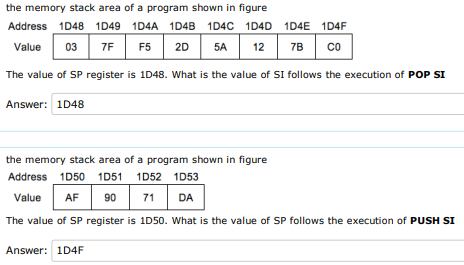


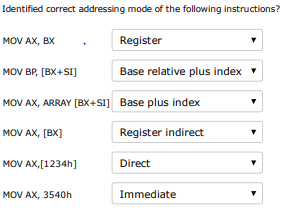


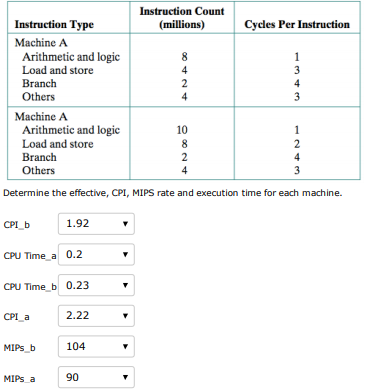






1. 



1. 
2. Choose correct RAID volume definitions for a request 2T storage.

**RAID 1 ­ Mirror volume 2 x 2T HDDs are needed, no data lost when the primary storage fails Spanned Volume 2T HDD + more HDDs to extend storage, no fault tolerance, data lost when one HDD fails**

**RAID 0 ­ Striped volume 2 x 1T HDDs are needed, enhance data transfer, no fault tolerance, data lost when one HDD fails**

**RAID5 Volume At least 3 x 2T HDDs, fault­tolerance, no data lost, no down­time**

1. Consider a 32­bit microprocessor whose bus cycle is the same duration as that of a 16­bit microprocessor. Assume that, on average, 30% of the operands and instructions are 32 bits long, 40% are 16 bits long, and 30% are only 8 bits long. Calculate the improvement achieved when fetching instructions and operands with the 32­bit microprocessor? **23%**
2. Consider a magnetic disk drive with 8 surfaces, 512 tracks per surface, and 64 sectors per track. Sector size is 1 kB, the average seek time is 10.2 ms and the drive rotates at 3600 rpm. What is average access time. Given: Rotational delay = 1/(2r), where r is the rotational speed in revolutions per second: **16.3**
3. Convert the 32-bit floating point number 44363C00 (in hex) to decimal

**DA: 1144404992**

1. The instruction that subtracts 1 from the contents of the specified register/memory location is

**DA: SUB**

1. Memory dump at 1D20:0200 as below:

1D20:0200 00 20 10 5D 55 47 00 90 - 00 10 20 30 40 50 60 70 Given value of registers: DS = 1D20, ES = 1D20, DI = 20A, SI = 208, BX = 202, AX = 0103, CX = 0003 and flag bit DF = 1 What is the correct value of AX, SI, DI registers after the instruction REP LODSW is executed?

**DA: DI = 0202h**

**AX = 5040h**

**SI = 5547h**

1. Which are correct action for SCASW string operation if DF is reset (=0)

**DA: compare value in AL register with memory location pointed by ES:[DI]**

1. Which are correct about the Pointer registers of IA-32 processors:

**ĐA: Base Pointer (BP): The 16 bit pointer refers to stack memory**

**Instruction Pointer (IP): the 16 bit register points to the next instruction to be execute**

**Stack Pointer (ESP): the 32 bit pointer to the top of stack**

1. What are components of Von Neumann, namely IAS computer?

**DA:** **Bus Memory CPU**

1. Which statements are correct for HDDs?

**DA: Head, Track, Sector are key parameters for access data on hard disk**

**Bits are stored on tracks**

1. The instruction that loads effective address is

**DA: LEA**

1. The following sequence of instructions are executed. What is the correct value of EAX, EBX, EDX at watch point?

MOV EAX,00002000 MOV EBX,00100000 MUL EBX

watch point:

**DA: EAX = 00000002**

**EDX = 00000000**

**EBX = 00021000**

1. The instruction, MOV AX, 1234h is an example of

Select one:

**DA: Immediate addressing mode**

1. The following sequence of instructions are executed. What is the correct value of flag bits at watch point?

MOV AL, 78

MOV BL, 2 MUL BL

watch point:

**DA: Carry flag (CF) = reset**

**Overflow flag (OF) = reset**

1. The following sequence of instructions are executed. What is the correct value of flag bits at watch point? MOV AL,-5 ADD AL,132 ADD AL,1 watch point:

**DA: Zero flag (OF) = set**

**Overflow flag (OF) = reset**

**Sign flag (SF) reset**

**Carry flag (CF) = reset**

1. In computer, how does the processor serve multiple interrupt request from devices?

**DA: Each device are assigned an interrupt priority, the device with higher priority will be served.**

1. the instruction, JMP C008:2000h is an example of

**DA: intrasegment mode**

1. in multiplication instruction, the result is taken from AX means the source operand is bit

**DA: 8**

1. Memory dump at 1D20:0200 shown as below:

1D20:0200 00 20 10 5D 55 47 00 90 - 00 10 20 30 40 50 60 70

Given value of registers:

DS = 1D20, ES = 1D20, DI = 20A

The following sequence of instructions is being executed: MOV SI,208h

MOV AX,0040h MOV CX,000Ah CLD

REPNZ SCASB

watch point:

. . . . .

What is the correct value of AX, SI, DI registers at watch point?

**DA: SI = 020Ch**

**DI = 4030h**

**AX = 020Bh**

1. What is the correct value of SI, AL (in hex) at watch point: 01: MOV SI, 300h

02: MOV AL, 10h

03: MOV CX, 7

04: Loop\_label:

05: MOV [SI], AL

06: ADD AL,10h

07: INC SI

08: LOOP Loop\_label watch point:

**DA: SI 308h**

**AL = 70h**

1. Basic functions that a computer can perform including:

**DA: Direct memory access Data processing Control Data storage**

1. Given a code snippet: int ax, bx;

...

if (ax >= bx) ax -=bx;

else

bx -=ax;

What is the equivalent logic sequence of instructions in Assembly

**DA: cmp ax,bx**

**jbe a\_label**

**sub ax,bx**

**jmp x\_label a\_label:**

**sub bx,ax x\_label:**

1. Given an assembly code copying the memory buffer Buff1 to Buff2: PUSH DS POP ES LEA SI, Buff1 LEA DI, Buff2 MOV CX,20 ;--- Start of block cp\_loop: MOV AL, Byte Ptr [SI] MOV Byte Ptr ES:[DI], AL INC SI INC DI LOOP cp\_loop ; ---End of block Choose equivalent string operations in place of block code from ---Start of block to ---End of block

**DA: CLD cp\_loop: REP MOVSB LOOP cp\_loo**

1. After each execution of POP instruction, the stack pointer is

**DA: increment by 1**

1. Given a row of memory image in debug

0AE8:0120 13 96 D0 E0 D0 E0 A2 1E - 99 80 3E 20 99 00 75 24 Initially, AX=BX=CX=DX=0, SI=128

What are value of AX,DX after execution of the following instructions?

MOV EDX, [SI] MOV EAX, [SI+4]

**DA: EDX = 99007524**

**EAX = 203E8099**

1. Which are valid based indexed addressing?

**DA: [BX][SI]**

1. Consider the following assembly instruction sequence XOR BX, BX CMP DL, 5 JLE a\_label CMP DL,17h JGE a\_label MOV BX, 10h a\_label: INC BX watch point: ... Choose correct value of BX register at watch point for different value of DL?

**DA: DL=0FFh 11h**

**DL=10 01h**

**DL=17h 01h**

**DL=0Ah 28h**

1. To set one or more bits in a byte value, use \_\_\_\_ **OR** \_\_\_\_\_\_ instruction
2. Major structural components of the CPU include:

**DA: Arithmetic and Logic Unit Control Unit Instruction Pointer (PC)**

1. Select correct match for AL and carry flag at watch point #1: MOV BL, 8C

MOV AL, 7E ADD AL, BL

watch point #1:

**DA: AL set**

**Carry flag 0A**

1. Given a code snippet: if (a>=0 && a <=9)

x = a + 30h;

else if (a >=10 && a <=15) x = a + 55;

The logic of the above code snippet in assembly is (with missing lines): 01: CMP DL, 0

02: --- **JMP a\_label** -------- ; possibly missing code 03: CMP DL, 9

04: ----- **empty** ------- ; possibly missing code 05: ADD DL, 30h

06: **----JMP x\_label**-- ; possibly missing code a\_label:

08: CMP DL, 0Fh

09: ------ **empty** ------ ; possibly missing code 10: ADD DL, 55

x\_label:

12: MOV AL, DL

...

1. Given a row of memory image in debug 072C:FFF0 00 00 00 01 00 00 2C 07 - 07 01 2C 07 17 72 00 00 SS=072C, SP=FFF8, DS = 072C Assume the stack now stores two (2) 16-bit parameters and one (1) 16-bit return address in following order: stack top (return address) >> parameter #1 >> parameter #2. The following sequence of instructions are executed. What is the correct values at watch points?

MOV BP, SP  
watch point #1 (BP):  **AX = 2C07**  
MOV AX, [BP+2]  
watch point #2 (AX): **BP = FFF8**  
ADD AX, [BP+4]  
watch point #3 (AX): **SUB AX, [SI]**  
MOV DI, 120  
MOV [DI], AX

1. Given a code snippet to look for a value (from AL) in memory buffer Buff Buff DB 11,22,33,44,55

................

01: LEA DI, Buff

02: ---- **Empty** ----- ; possibly missing code 03: MOV AL,33

04: MOV CX,5

a\_label:

05: --- **INC DI** --- ; possibly missing code 06: CMP Byte Ptr [DI],AL

07: --**DEC DI**--- ; possibly missing code 08: LOOPNZ a\_label

...

1. multiplication instruction, when the value of source operand is 12 (decimal), the other operand is loaded in AX. Which registers can be used to load source operand?

**DA: DX**

1. The following sequence of instructions are executed. What is the correct value of AX and DX (in hex) at watch point?

MOV AX,FFF6h  
MOV CX,1000h  
IMUL CX

DA: AX= FFF6

DX= 6000

1. the instruction, CMP to compare source and destination operands by

**DA: comparing**

1. To test one bit in a byte value which can be destructive. Use **TEST** instruction.
2. Which are correct input for XLAT instruction

**DA: DS:[BX] pointed to look-up table**

1. Which are correct action for LODSW string operation if DF is reset (=0)

**DA: increase SI by 2**

**Load 16-bit value at memory location pointed by ES:[DI] into AX**

1. The following sequence of instructions are executed. What is the correct value of flag bits at watch point?

**DA: OF = reset**

**CF = reset**

1. The following sequence of instructions are executed. What is the correct value of AX, DX at watch point?

MOV DL,FF MOV AL,42 IMUL DL

watch point:

**DA: AX = FF00**

**DX = FFBE**