

UNIVERSITY OF JORDAN
FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING

Assembly Language and microprocessor
Quiz No: I A

Name:
Section:

Student.ID:
Date: October , 15th 2008

a- Fill in the spaces

- The register BX is **16** bits wide while the register AL is **8** bits
- The P (Party) flag bit is ...**1 (one)** for even party and**0 (Zero)** for odd party
- There are ...**4-6 (Four to six)** segment registers in various versions of the microprocessor.
- The register ESP stands for ...**Extended Stack Pointer**
- If the beginning address of the segment is 1000H then the ending address is ... **1FFFF** .H.

b- put \checkmark in front of correct statement and \times in front of wrong one

- (\checkmark) The ESP registers has only a 16-bit name for his lower half.
- (\times) A memory segment can touch but can not overlap
- (\times) The registers SP/ESP are used with DS register to locate the next instruction
- (\checkmark) Segment is relocatable by changing only the contents of the segment register to address the program in the new area of memory.
- (\checkmark) In a multiple core microprocessor each core contains the same programming model.

Convert the following decimal numbers into a single-precision floating point numbers:
 (a) +21.5

Decimal	Binary	Normalized	sign	Biased Exponent	Mantissa
+21.5	10101.1	1.01011 x 2 ⁴	0	1000011	010110000000000000000000

Sign bit 0

+21.5 >>> 0010101.1 >> 001.01011x 2⁴ real exponent is 4 in binary 0100 displaced exponent is 127+4= 131 in binary equal 1000011

Then the number is represented as

Sign	Exponent	Fraction (Mantissa)
0	1000011	01011000000000000000000000000000

Convert the following single-precision floating point numbers into decimal numbers:

(a) 0 1000000 110000000000000000000000

Solution:

Sign +

Real exponent = 1000000 – 01111111 = 1

Fraction 110000000000000000000000

Number is 1.110000000000000000000000 x 2¹ = 11.1000 >>> 3.5

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a- Fill in the spaces

- The register EBX is **32** bits and contains three different section that can be addressed separately named ... **BL**, **BH**, **BX**
- In real-mode addressing the maximum length of a segment is ... **64 KB** bytes
- The effective address for the memory location 0F00:2000 is ...**11000**.....
- The assembler directive DB defines a **BYTE** of width **8** Bits
- The register EBP stands for **Extended Base Pointer**

b- put \checkmark in front of correct statement and \times in front of wrong one

- (\checkmark) The program invisible registers are not addressable directly during application programming
- (\times) All registers in the program model can be accessed using their 8 bits or 16 bits or 32 bits name
- (\times) The register SI is divided to two registers each of 8 bits
- (\times) The SP registers has an 8-bit name for his lower half.
- (\checkmark) The combinations (CS:IP or CS:EIP) locates the next instruction executed by the microprocessor.

Convert the following decimal numbers into a single-precision floating point numbers:
a- 10.625

Solution:

$10.625 \gggg 1\ 00001010.101 \ggggg 1.010101 \times 2^3$

Real Exponent is 3 , Displaced exponent = $3 + 127 = 130 \gg 10000010$ and mantissa 1010101

Sign Exponent Mantissa
0 10000010 0101010000000000000000

Decimal	Binary	Normalized	sign	Biased Exponent	Mantissa
10.625	1010.101	1.010101×2^3	0	10000010	0101010000000000000000

Convert the following single-precision floating point numbers into decimal numbers:
(b) 0 10000010 1001000000000000000000

Sign Exponent Mantissa
0 10000010 1001000000000000000000
+ 00000011 = 3

Then the real number = $1.100100 \times 2^3 = 1100.100 = + 12.5$

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Assembly Language and microprocessor
Quiz No: I C

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a- Fill in the spaces

- The register EAX is ... **32** bits wide while the register BX is ... **16** bits

The different segments used by a program are

- **CODE Segment**.....
- **Data Segment**
- **Stack Segment**
- **Extra Segment**

In DOS system TPA Transient program area is **640** K bytes and The System area is **384**K bytes)

- The register BX is **16** bits wide while the register AL is **8** bits

b- put \checkmark in front of correct statement and \times in front of wrong one

(**X**) Data transfer can affect the flag bits

(\checkmark) In real-mode addressing if the beginning segment address is 028FH the memory location having an effective address of 03FFFH lies within the segment.

(**X**) The maximum size of any memory segment is 640K bytes of memory

(\checkmark) Segment and Offset Addressing Scheme Allows Relocation

(**X**) The DI registers has an 8-bit name for his lower half.

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Assembly Language and microprocessor
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a- Fill in the spaces

- The register EBX is ... **32** bits wide while the register AX is **16** bits
- If the beginning address of the segment is 0100H then the ending address is ... **10FFF** .H.
- If CS=1F00H and IP/EIP = 2100H the next instruction address is ... **21100**H
- The effective address for the memory location 0F10:1200 is **10300**
- The assembler directive DQ defines a ... **quad word** of width **64** Bits

b- put \checkmark in front of correct statement and \times in front of wrong one

- (\checkmark) The DI registers is a 16-bit register.
- (\times) The registers SP/ESP are used with CS register to locate the next instruction
- (\checkmark) The maximum size of any memory segment is 64K bytes of memory
- (\times) The SI registers has an 8-bit name for his lower half.
- (\times) The combinations (DS:BX) locates the next instruction executed by the microprocessor.

**C- Convert the following decimal numbers into a single-precision floating point numbers:
 (b) +19.75**

19.75 \rightarrow 10011.11 \rightarrow 1.001111 \times 2⁴

Biased exponent 127+4 \rightarrow 01111111 + 100 \rightarrow 10000011

Sign \rightarrow 0

Mantissa 001111000000000000000000

Decimal	Binary	Normalized	sign	Biased Exponent	Mantissa
+19.75	10011.11	1.001111 \times 2 ⁴	0	10000011	001111000000000000000000

**D- Convert the following single-precision floating point numbers into decimal numbers:
 (c) 0 10000011 110011000000000000000000**

Sign 0 \rightarrow +

Exponent 10000011 – 01111111 = 100 = 4

Number 0.110011 \rightarrow 1.110011 \times 2⁴ \rightarrow 11100.11 \rightarrow +28.75