CSE 2312 Computer Organization & Assembly Language Programming

QUIZ4

Student Name: _____.

Student ID: _____.

TRUE OR FALSE (2pts per)

Q:	1	2	3	4	5	6	7	8	9	10
T/F	F	T	T	F	T	T	T	T	T	F

1. The floating number 01000101.0000000000011011 is a normalized floating number. F

2. $(1011)_2$*$(110)_2$is $(1000010)_2$ T

3. $(1011)_2$*$(101)_2$is $(110111)_2$ T

4. The IEEE single precision format of decimal number 0.25is $3F800000_H$ F

5. The IEEE single precision format of decimal number 0.375is $3EC00000_H$ T

6. The corresponding decimal number is 25 for the IEEE single precision format $41C80000_H$ T

7. The computer can only deal only with numbers that can be represented in a fixed number of digits. T

8.Suppose we build the set of positive integers representable by three decimal digits, with no decimal point and no sign. Then, this set has exactly 1000 members:T

9.The algebra of finite-precision numbers is different from normal algebra. T

10. The associative law holds for the algebra of finite-precision numbers, however, the distributive law does not hold for the algebra of finite-precision numbers.F

Multiple Choices (6pts each)

(The following questions may have one and more correct answer. Pick all correct answers.)

1. **The arithmetic used by computers differs in some ways from the arithmetic used by people. Which of the following is true? [a,b,c]**

(a) Most computers use the binary rather than the decimal system for representing numbers.
(b) Most persons are accustomed to use the decimal system to represent the numbers
(c) Computers perform operations on numbers whose precision is finite and fixed.
(d) Computers perform operations on numbers whose precision is not finite and fixed.

2. **Suppose a decimal number 2001. Which of the following is true? [a, b,c]**

(a) Its binary version is 11111010001
(b) Its octal version is 3721
(c) Its hexadecimal version is 7D1
(d) None of them are true

3. **Suppose a decimal number 9. Which of the following is true? [a,b,c,d]**

(a) Its binary version is 00001001
(b) The signed version of decimal number -9 is 10001001
(c) The 1's complement version of decimal number -9 is 11110110
(d) The 2's complement version of decimal number -9 is 11110111

4. **Which of the following is true about the floating number and the real number? [b, c]**

(a) The real number has the finite nature of the representation for numbers
(b) The floating number has the finite nature of the representation for numbers
(c) The average of two real numbers is still another real number
(d) The average of two floating numbers is still another floating number

5. **Which of the following is true about the range and precision? [b,c]**

(a) The precision is effectively determined by the number of digits in the exponent
(b) The range is effectively determined by the number of digits in the exponent
(c) The precision is determined by the number of digits in the fraction
(d) The range is determined by the number of digits in the fraction

Computation and Short Answer (10pts each)

(**Please give detailed computation process for your final results!**)

1. Please do the following binary multiplication and give the computation step by steps:

(2) 1100 x 11 = **100001**

(1) 1011 x 10= **10110**

(3) 1100 x 101 =**111100**

(4) 10111 x 1001 =**11001111**

(5) 10111 x 1100 =**100010100**

2. Please do the following binary division and give the computation step by steps:

(1) 1011 / 11 = **11 rem 10**

(2) 1001 /11=**11**

(3) 1011 / 110 =**1 rem 101**

(4) 1011 / 101 =**10 rem 1**

(5) 1100 / 111 =**1 rem 101**

3. Please converse the following decimal numbers to its binary, octal and hexadecimal version correspondingly:

1) 12

2) 60

3) 127

4) 1023

5) 2049

Decimal	Binary	Octal	Hex
12	**1100**	**14**	**C**
60	**0011 1100**	**74**	**3C**
127	**0111 1111**	**177**	**7F**
1023	**0011 1111 1111**	**1777**	**3FF**
2049	**1000 0000 0001**	**4001**	**801**

4. Please converse the following decimal numbers to IEEE single precision format step by step:

1) 25.375

2) 12.50

1) $25.375 = 11001.011 = 1.1001011 * 2^4$

So exponent part 10000011

Number = 0100 0001 1100 1011 0000 0000 0000 0000 = **41CB0000**

2) $12.50 = (1100.1)_2 = 1.1001 * 2^3$

So, exponent part = 130 = 10000010

So, the number is 0100 0001 0100 1000 0000 0000 0000 0000 = $\mathbf{(41480000)_H}$

5. Please converse the following IEEE single precision numbers to decimal numbers step by step:

1) $3EC00000_H$

2) $3E800000_H$

1) **$1.1*2^{-2}$** = 0.011 = 0.375
2) **$1.0*2^{-2}$** = 0.01 = 0.25