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Computer Science Department
Comp131 Mid Term Exam
Fall 2014/2015 **Time: 75 minutes**

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Question I (28%)

A. (24%) *Select the best answer for each of the following questions (1-8):*

1) $(54)_7 = (\_\_\_\_\_)_2$
A) 101011 B) 100101 C) 101001 D) None of the above

2) Using 8 bits to represent an integer, the 2's complement representation of the integer (-23) is:
A) 10010111 B) 00010111 C) 11101001 D) None of the above

3) 26 in Octal equals the following Hexadecimal value:
A) 16 B) 26 C) 13 D) None of the above

4) An integer value is usually represented in memory using:
A) 2 bytes B) 2 bits C) 16 bytes D) 3 bytes

5) The representation for the character 'B' in memory (in hexadecimal) is:
A) 62 B) 26 C) E2 D) None of the above

6) $(2B3A)_{16} = (\_\_\_\_\_)_4$
A) 3220223 B) 2230322 C) 25472 D) None of the above

7) The following are all computer output devices except:
A) printer B) screen C) mouse D) None of the above

8) Which of the following MS Excel formulas is used to calculate the average value for numbers in range B2:E2
A) avg(B2-E2) B) average(B2:E2) C) avg(B2:E2) D) None of the above

Answer Sheet for Question I (Part A): =avg(B2:E2)

1) D
2) C
3) A
4) A
5) D
6) B
7) C
8) C

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B. (4%) List and briefly define the four steps of the CPU machine cycle:

1. Fetch ⇒ get next instruction
2. Decode ⇒ Analyze instruction
3. Execute ⇒ run instruction
4. Store ⇒ save to memory

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Question II (25%)

A) ***(13%)*** Using 2's complement with an *8 bit pattern*, evaluate the following expression (***show your work***):

$(70)_{10} - (212)_3 = (\ 00101101\ )_2$

$(212)_3 \Rightarrow (23)_{10} \Rightarrow (11001)_2$

$3^2\ 3^1\ 3^0$

$9+3+2$

2	70
0	35
1	17
1	8
0	4
0	2
0	1
1	0

2	23
1	11
0	5
0	2
1	1
1	0

$(01000110)_2 + (11100111)_2 =$

$11100111 \Rightarrow -23$

01000110

$11100111 +$

100101101

B) ***(12%)*** What is the floating point representation of the following decimal value $(36.125)_{10}$ in memory. ***Show your work.***

$(36.125)_{10} \rightarrow (100100.001)_2$

$0.125 \times 2 = 0.25$

$0.25 \times 2 = 0.5$

$0.5 \times 2 = 1.0$

2	36
0	18
0	9
1	4
0	2
0	1
1	0

$2^5 \times 1.00100001$ significant mantissa

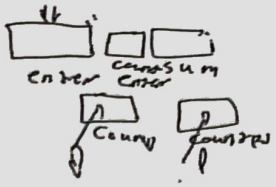
$127 + 5 = (132)_{10}$

2	132
0	66
0	33
1	16
0	8
0	4
0	2
0	1
1	0

0 | 10000100 | 00100001000000000000000

1 0 9 0 8 0 0 0

memory



Question III (20%)

Write an algorithm (pseudo code) that keeps asking the user to enter integers less than a 100 (e.g. 45, 9, 78 ,...) one at a time until the sum of all integers entered exceeds (يزيد عن) 1000. Your algorithm should then display the *count* of how many even and how many odd integers where entered as well as which has the larger sum (sum of even integers entered or sum of odd integers entered). Assume they will have different sums.

Aske user to enter any number
Read number and save to num
set sum equal to zero
set counter$_E$ equal to zero
set counter$_O$ equal to zero
set sum counter$_E$ equal to zero
set sum counter$_O$ equal to zero
while num less than one hundred less than one thousand
If sum greater then one thousand
divided num by two
If remind equal to zero
add one to counter$_E$
add num to sum counter$_E$
Else
add one to counter$_O$
End If add num to counter$_O$
Else
print Error to secreen
End If
End while
If sum counter$_E$ greater than counter$_O$
print counter$_E$ to secreen
Else
print sum counter$_O$ to secreen
End If
print counter$_E$ to secreen
print counter$_O$ to secreen

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Question IV (27%)
A) (15%)

Clearly explain the difference between the following pairs of terms:

i) ***Web*** vs ***Internet***:

web ⇒ software in the internet

internet ⇒ part of hard-ware e.g. cable - ~~computers~~

ii) ***Markup language*** vs ***Programming language***:

Markup language ⇒ e.g(HTML)

programming language ⇒ e.g(Java)

iii) ***Compiler*** vs ***Interpreter***:

Compiler ⇒

interpreter ⇒

B) (6%)

Define the following terms giving an example of each:

Protocol: ~~قواعد~~ example(http)

LAN: local area network (wifi)

C) 6%

What do each of the following acronyms stand for:

ALU: ~~arithmetic logic unit~~

HTTP: hyper text transfer protocol

W3C: world wide web