



BIRZEIT UNIVERSITY

Computer Science department

Introduction to Computers and Computing Ethics (COMP131)

Midterm Exam

First Semester 2015/2016

Time: 75 minutes

Date: Tuesday 10/11/2015

Name _____

ID _____

Sec# _____

Circle the instructor name A) Nael Qaraeen B) Hafez Barghoutli

Question I (36%)

A. (30%) Select the best answer for each of the following questions (1-10):

- 1) The number of possibilities (different values) that can be represented using a single byte (8 bits) is:
A) 1 B) 8 C) 32 D) None of the above
- 2) The right order for the four steps of the CPU machine cycle:
A) Executing, Storing, Fetching and Decoding
B) Fetching, Decoding, Executing and Storing
C) Decoding, Executing, Storing and Fetching
D) None of the above
- 3) $(86)_{10} = (\quad)_2$
A) 1001110 B) 100101 C) 1001011 D) None of the above
- 4) Using 8 bits to represent an integer, the 2's complement representation of the integer (-25) is:
A) 00011011 B) 00011100 C) 11100101 D) 11100111
- 5) 15 in Hexadecimal equals the following Octal value:
A) 6 B) 23 C) 23 D) None of the above
- 6) A float value is usually represented in memory using:
A) 2 bytes B) 16 bits C) 4 bytes D) 5 bytes
- 7) The following are all computer output devices except (إدخال):
A) Speaker (sound blaster) B) Scanner C) Printer D) Monitor
- 8) $(2557)_{10} = (\quad)_8$
A) 111233 B) 111133 C) 213133 D) None of the above
- 9) The following are all CPU components except:
A) ROM B) CU C) Registers D) ALU
- 10) Which of the following MS Excel formulas is used to calculate the Standard deviation value for numbers in range C2:F2
A) =stdev(C2:F2) B) =std(C2:F2) C) =stdev(C2:F2) D) None of the above

3 each

Answer Sheet for Question I (Part A): B

1	2	3	4	5	6	7	8	9	10
D	B	A	D	B	C	B	A	A	C

B. (6%) Rank the following according to Storage, cost and performance capacity from high to low. RAM, Hard Disk, cache, Registers

Performance	Registers	Cache	RAM	Hard Disk
Cost	Registers	Cache	RAM	Hard Disk
Storage	Hard Disk	RAM	Cache	Registers

0.5 each

Form: A



Key

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Question 1 (36%)

A. (30%) Select the best answer for each of the following questions (1-10):

- 1) The number of possibilities (different values) that can be represented using a single byte (8 bits) is:
A) 1 B) 8 C) 256 D) None of the above
- 2) The right order for the four steps of the CPU machine cycle
A) Fetching, Decoding, Executing and Storing
B) Executing, Storing, Fetching and Decoding
C) Decoding, Executing, Storing and Fetching
D) None of the above
- 3) $(76)_9 = (\quad)_2$
A) 1001011 B) 1000101 C) 1001001 D) None of the above
- 4) Using 8 bits to represent an integer, the 2's complement representation of the integer (-27) is:
A) 00011011 B) 00011100 C) 11100101 D) None of the above
- 5) 13 in Hexadecimal equals the following Octal value:
A) 6 B) 26 C) 23 D) None of the above
- 6) A float value is usually represented in memory using:
A) 2 bytes B) 32 bits C) 16 bytes D) 5 bytes
- 7) The following are all computer input devices except (1 is):
A) Keyboard B) Mouse C) Printer D) Scanner
- 8) $(2537)_8 = (\quad)_4$
A) 331111 B) 111133 C) 213133 D) None of the above
- 9) The following are all CPU components except:
A) ALU B) CU C) Registers D) ROM
- 10) Which of the following MS Excel formulas is used to calculate the Standard deviation value for numbers in range C2:F2
A) =stdev(C2:F2) B) =stdev(C2:F2) C) =std(C2:F2) D) None of the above

Answer Sheet for Question 1 (Part A):

1	2	3	4	5	6	7	8	9	10
C	A	B	C	C	B	C	B	D	B

B. (6%) Rank the following according to performance, cost and Storage capacity from high to low, RAM, Hard Disk, cache, Registers.

Performance	Registers	Cache	RAM	Hard Disk
Cost	Registers	Cache	RAM	Hard Disk
Storage	Hard Disk	RAM	Cache	Registers

0.5 each

Question II (25%)

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

$$(43)_{16} - (123)_4 = (\quad)_2$$

$$(43)_{16} \rightarrow 0100\ 0011 \Rightarrow 3 \text{ Mark}$$

$$(123)_4 \rightarrow 00011011 \Rightarrow 3 \text{ Mark}$$

$$\begin{array}{r} \text{1's} \\ \text{comp} \rightarrow 11100100 \\ \hline \text{2's} \\ \text{comp} \rightarrow 11100101 \end{array} + \Rightarrow 3 \text{ Mark}$$

$$\text{Result } 00101000 \Rightarrow 4 \text{ Mark}$$

B) (12%) What is the floating point representation of the following decimal value $(-43.875)_{10}$ in memory. Show your work.

$$(43)_{10} \rightarrow 101011 \Rightarrow 2 \text{ Mark}$$

$$(0.875)_{10} \rightarrow 0.111 \Rightarrow 2 \text{ Mark}$$

$$\text{exponent: } 5 \Rightarrow 2 \text{ Mark}$$

$$(132)_{10} \rightarrow 10000100 \Rightarrow 2 \text{ Mark}$$

$$\begin{array}{c} 1100001001011110000000000000 \\ \hline C \quad 2 \quad 2 \quad F \quad 8 \quad 0 \quad 0 \quad 0 \end{array}$$

00
80
2F
C2

4 Mark

Question Three (20 Marks)

Write an algorithm that receives grades of several students in computer 230 final exam. After the last grade is entered, the sentinel amount of -1 is entered. Dr. Adel has decided to give each student above 85 a bonus of 5%. Your algorithm should calculate the average of grades for "pass" students (over or equal 60), before the bonus and the average of grades for "pass" students after the bonus. This will help Dr. Adel to decide whether or Not to apply the bonus.

3 Mark

set sumBeforeBonus equal Zero
set sumAfterBonus equal Zero
set counterPass equal Zero

2 Mark

Input the grade X

while X is not equal minus one

IF X is greater or equal sixty Then

Add one to counterPass

6 Mark

Let sumBeforeBonus equal the old sumBeforeBonus added by X

IF X is greater or equal fifty eight Then

4 Mark

Let X equal the old X added by multiplication of X by 0.05

Mark

End IF

Let sumAfterBonus equal the old sumAfterBonus added by X

End IF

5 Mark

Input the next grade X

End while

Let avgBeforeBonus equal

Let avgAfterBonus equal

sumBeforeBonus divided by counterPass

sumAfterBonus \div $=$ $=$

Print avgBeforeBonus
avgAfterBonus

Question IV (19%)

A) (9%)

Clearly explain the difference between the following pairs of terms:

3 each

i) HTML vs HTTP:

HTML: Hypertext markup language which describes the web page content (what to display and how to display it) while HTTP: Hypertext transfer protocol is a protocol that responsible for transferring the web page among the application layer.

ii) Application Layer vs Transport Layer:

The upper layer in the TCP stack that responsible for communication between application while transport is the layer below that is responsible for transmission and integrity (error correction).

iii) High level Language vs Machine Language:

High level language is a programming language (e.g. c, c++, Java) interpreted by programmer while the machine language is the binary level 0,1 interpreted by machine.

B) (6%)

3 each

Define the following terms giving an example of each:

1.5: Def

WAN: wide-area network example internet

1.5: example

Compiler: a translator from high level language to low level language (machine language) & language compiler

C) (4%)

What do each of the following acronyms stand for?

TCP: Transmission control protocol.

2 each

FTP: File transfer protocol.