

Q1	30	30%
Q2	30	30%
Q3	19	20%
Q4	18	20%
Total	97	100%

Time: 90 minutes

A

Date: 18/11/2019

Student Name: Obada Tahayna

Student ID: 1191309

Dr. Sobhi Ahmad sec 1 sec 8

Mr. Murad Njoum sec 4 sec 5

Mr. Hafez Barghouthi sec 2 sec 3

Dr. Ahmad Abusnaina sec 6 sec 7

Question #1 [30 points] Numbering and data rep.

A) Using 8-bits pattern and two's complement, find the answer of the following arithmetic operation. [12 points]

$(2C)_{16} - (156)_8 = (1011110)_2 = (-66)_{10}$

$(2C)_{16} \rightarrow (0010\ 1100)_2$
 $(156)_8 \rightarrow (01\ 101\ 110)_2$
 $\begin{array}{r} 10\ 010\ 001 \\ 10\ 010\ 010 \end{array}$

$\begin{array}{r} 10\ 1111\ 10 \\ 01\ 0000\ 01 \\ 01\ 0000\ 10 \\ \hline 01\ 0000\ 10 \end{array}$
 $(01\ 0000\ 10)_2 \rightarrow 2 + 24 = (26)_{10}$

$\begin{array}{r} 0010\ 1100 \\ 1001\ 0010 \\ \hline 1011\ 1110 \end{array}$

~~$\begin{array}{r} 1011110 \\ 0100001 \\ 0100001 \\ \hline 0100010 \end{array}$
 $2 + 24 = 26$~~

B) The following is a representation for a text in the computer memory. Find out the original word for this representation, if you know that an even parity was used. [9 points]

Memory

71	$(71)_{16} \rightarrow (0111\ 0001)_2 \rightarrow (113)_{10}$	q
F3	$(F3)_{16} \rightarrow (1111\ 0011)_2 \rightarrow (115)_{10}$	s
E1	$(E1)_{16} \rightarrow (1110\ 0001)_2 \rightarrow (97)_{10}$	a

A: 97
a: 8

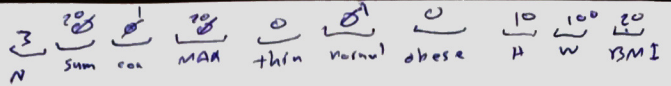
The word is qsa

C) Convert the following number to binary $(712.6)_{10} = (1011001000.1001)_2$ [9 points]

$(712)_{10}$
 $\begin{array}{r} 712 \\ 200 \\ \hline 512 \\ 200 \\ \hline 712 \end{array}$

0.6	AR	1.2
0.2	A2	0.4
0.4	A1	0.8
0.8	A1	1.6
0.6	A2	1.2

$\begin{array}{r} 1001 \\ 0010 \\ 128 \\ 500 \\ \hline 712 \end{array}$



Question #2 [30 points] Algorithms

Write an algorithm that reads the weight and height for many persons; ask the user to input their count.

The algorithm should calculate and display the BMI (Body Mass Index) for each one. Then, your

algorithm should also display the **average** BMI, the **highest** BMI, **number** of persons who are **thin** (i.e.

their BMI value under 18), number of persons who are **normal** (i.e. their BMI value between 18 to 25)

and number of persons who are **obese** (i.e. their BMI value above 25). Finally, calculate and display the

percentage of normal people over all persons. ✓ 1) BMI For each one

Use the following formula $BMI = \frac{Weight}{Height^2}$

- ✓ 2) Avg
- ✓ 3) Max

- ✓ 4) Num of thin
- ✓ 5) Num of Normal
- ✓ 6) Num of obese
- ✓ 7) % of Normal

29
+1 bonus

أكتب خوارزمية لقراءة الوزن و الطول لعدة اشخاص، اطلب من المستخدم إدخال عددهم. يجب على الخوارزمية القيام بحساب وعرض مؤشر كتلة الجسم (مكج) لكل شخص كما هو موضح بالمعادلة بالأعلى. يجب على الخوارزمية أيضا حساب وعرض متوسط مكج، أعلى قيمة ل مكج، عدد الاشخاص الذين يمكن تصنيفهم كأشخاص نحيفين أو أشخاص عاديين (طبيعيين) أو أشخاص ذو سمنة زائدة. أخيراً، قم بحساب و عرض نسبة الاشخاص الذين تم تصنيفهم كأشخاص عاديين الى جميع الاشخاص.

START

```

ask user to enter number of persons / and save in N +1.5
set sum to zero
set counter to zero
set MAX to zero
set thin to zero +2
set normal to zero
set obese to zero

while counter is less than N +3
  ask user to enter weigh and save in W
  while W is less than or equal zero
    print "error"
    ask user to enter weigh and save W
  END while
  ask user to enter heigh and save in H +1.5
  while H is less than or equal zero
    print "error"
    ask user to enter heigh save in H
  END while
  Divide W by (H multiply H), save in BMI
  Print BMI
  add BMI to sum and save in Sum
  IF BMI more than MAX THEN
    set MAX to BMI
  END IF

```

```

IF BMI is less than 18 THEN
  increment thin
ELSE IF BMI is less than 25 THEN
  increment normal
ELSE
  increment obese
END IF

increment counter +1

END while +1

Divide Sum by counter and save it in AVG +1
Print "Average is " AVG +1
Print "Max BMI is " MAX +1
Print "The number of thin is " thin
Print "The number of normal is " normal
Print "The number of obese is " obese

Divide normal by N and multiply it with 100
and save it in PERCENT +1

Print "The Percentage of normal is " PERCENT % +1
END

```

Question #3 [20 points] Short answers

1- What is the function of Presentation layer?

(sixth layer)

[6 points] +6

- encryption and decryption
- Exchange data from type to other (e.g. ASCII to EBCDIC)

2- What does the following two acronyms stand for and explain the difference between them?

[8 points]

> TCP: Transmission Control Protocol

(Both protocols are in fourth layer)

This protocol determine if data arrives or not

[check if there are errors or not]
make sure that data arrived correctly.

> UDP: User Datagram Protocol

(Both protocols are in fourth layer)

This protocol doesn't check if data arrives or not.

[doesn't check errors]

3- What is the function of Domain Name System (DNS) and explain how it works?

[6 points] +6

These servers contain tables that contain the domain and the IP of websites, when user request domain like "google.com" server response with the IP of website.

when user request domain, the first DNS server check if it contain it, if yes, it will response with the IP, if not, it will move the process to another DNS server, and so on.

Question #4 [20 points]

Concepts Matching

A

Choose the most suitable word/phrase from the list in Table-1 that most match the concept/statement in Table-2 and put its number. See the example at the first row.

Number	Word
1	ASCII code
2	Registers
3	Bandwidth
4	Operating System
5	ROM
6	Touch screen
7	Unicode
8	Set counter to zero
9	Dependency on papers
10	Reliability
11	Arithmetic and logic unit <i>ALU</i>
12	Super computer
13	Central processing unit <i>CPU</i>
14	Control unit <i>CU</i>
15	Web server computer
16	RAM
17	MS Word
18	If Else
19	While loop
20	Hardware
21	COMP131

18

No.	Statement	Answer
*	The first computer course you are studying in Birzeit University. *Just as an Example*	21
1	The maximum quantity of data that can be transmitted through a communication medium in a given amount of time.	3 ✓
2	When starting a computer, the CPU automatically begins executing some start-up instructions stored in _____.	5 ✓
3	_____ allows for more characters to be used in the computer system (i.e., more than 20,000 characters).	7 ✓ #
4	One of the Fundamental Characteristics of Computers	12 ✓
5	Is powerful but expensive computer; used for complex computations.	12 ✓
6	Directs the computer system to execute stored program instructions.	20 ✓ #
7	High-speed temporary storage areas located within the CPU.	21 ✓
8	It is responsible for the management and coordination of activities and the sharing of the limited resources of the computer.	4 ✓ #
9	Is considered as an input and output device.	6 ✓
10	Used in algorithms if we want to repeat one instruction or more several and many times.	19 ✓