HIDEUX LELAHEL
Grade: 15.5/20 (total : 41.5/54)

+30/1/2+

Digital Tools exam 2021-2022

Sections : FC, FAS, AMER, AS, EUR, SCAN
Rating scale : 45 points, normalized to 20 (1pt per lecture question, 2pts per computation)
Duration : 1h
Documents : forbidden
Calculator : forbidden

Numéro étudiant :

Group 62
Name Lelahel
Surname HIDEUX

1 Instructions

- **Do not fold the copy !**
- Blacken the cells with a **black pen** : do not surround the cells !
- To correct : whiten the cell, **without** rebuilding it.
- The whitening of the cell must be very clean and should not leave any shadow
- The student number must be checked
- Do not restart the MCQ with a new subject, you would have to start from the beginning as all the question may be different
- The subject is **double-sided**

2 Lecture questions

Rating scale : a correct response is worth 1, and the lack of answer is worth 0. Otherwise the score is the *pro rata* between the number of correct and incorrect answers. The score cannot go below -0,5.

Month	Jan	Mar	May	Jul	Sept	Nov
Height of rain (in mm)	31	38	75	58	52	40
Uncertainty of measure	3	2	2,5	3	2	1,5

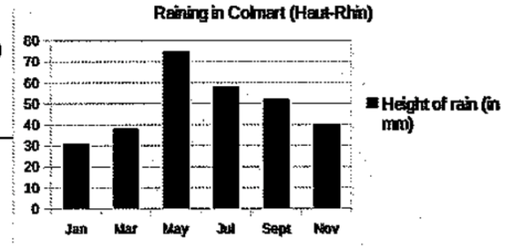


Figure 1

	A	B	C	D
1		VAT rate	20,60 %	
2				
3				
4	Price excl. VAT	2,00 €	42,00 €	210,00 €
5	VAT amount	=		

Figure 2

Question 1 Considering the non signed integer 79AF in hexadecimal, we can say that :
- [x] it represents a positive number
- [ ] it can be divided by 2 0.5/1
- [x] it can be coded on 4 bytes

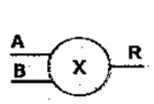
Question 2 When writing a report, tick what seems correct to you :
- [x] indices and exponents are important in a chemical formula written in my report
- [x] the variables used in formulas should be explained when they first appear in the text 0.5/1
- [ ] I can insert, as is, a picture taken with my smartphone in a mathematical formula, functions are written in italic

Question 3 What can you say about "Home_INSA"?
- [x] It's a network mount
- [ ] It's a unique hard drive 1/1
- [ ] It's a drive that is located on the computer I'm using

Question 4 Among the following choices, which ones could be valid path, under Windows or Linux ?
- [ ] \home\monLogin
- [ ] c :/users/monLogin
- [x] c :\users\monLogin
- [x] /home/monLogin 1/1

Question 5 In a spreadsheet, if I use the number formatting 0.00"m", this allows :
- [ ] nothing, because this format is not valid.
- [x] to include values in some computations. 0.5/1
- [x] to display the unit after the values.
- [ ] to necessarily have 1 decimal.

Question 6 In the following figure, which logical door should you put in X to get an 1 bit adder without carry ?



Truth table of 1 bit adder

A	B	R
0	0	0
0	1	1
1	0	1
1	1	0

- [ ] NOT
- [ ] AND
- [x] OR 1/1
- [x] exclusive OR

Question 7 Among the following statements, which one(s) are true ?
- [ ] In order to compare two binary floating numbers, you have to compute their decimal values
- [x] We can represent the number -8_{10} in two's complement signed integer on 4 bits 0.5/1
- [x] We identify the sign of a signed binary integer on 16 bits using the value of the most significant bit
- [ ] The IEEE 754 standard allows to represent all real numbers

Question 8 Tick the correct statement(s). In a word processing software...
- [ ] we redefined the styles at each new document
- [x] if I move a figure, the numbering of figures in the document will change accordingly
- [x] we can define a style from an existing one 1/1
- [ ] once defined, a table of contents can't be modified
- [ ] anchoring an image consists in reducing its luminosity

Question 9 If I receive an email from the DSI (IT services) telling me that there is a problem with INSA servers, what should I do ?
- [x] Do not click on the provided links
- [x] Check the address of the sender 0.5/1
- [ ] Throw away the message
- [ ] Check if the message comes from the DSI by answering to it

Question 10 What is the smallest memory among the following ones ?
- [x] Register
- [ ] Cache memory
- [ ] GFOT memory
- [x] Central memory (RAM) 1/1

Question 11 Among the following statements, which one(s) is (are) true ?
- [x] The ASCII codes of lowercase letters follow one after the other
- [x] To get the ASCII code of 'D', you add 3 to the ASCII code of 'A' 0.5/1
- [x] In the ASCII table, the code for '7' is 00000111
- [ ] To get the ASCII code of letter 'a', you add 16 to the ASCII code of letter 'A'

Question 12 In Figure 2, we would like to compute the taxes (VAT amount) corresponding to the price excluding VAT displayed in row 4, using the VAT rate. Which formula should you write in B5 such that you can copy them in C5 and D5 (and the computation of taxes remains correct) and change the VAT rate in C1 ?
- [ ] =$B4*20,6
- [ ] =$B4*$C1
- [x] =B4*$C1 1/1
- [ ] =$B4*$C$1
- [ ] =B4*20,6

Question 13 In France, among the following actions, which one would have the most positive ecological influence ?
- [ ] Save my favourite websites in my bookmarks
- [ ] Browse my old emails to erase from the server those that I don't need anymore 1/1
- [x] Change my phone one year later than planned
- [ ] Do not stream movies in 4G on my phone, but look at movies on a TV, through your internet box

Question 14 At INSA, the virtual desktop :
- [x] uses virtual machines hosted by the DSI
- [x] is a way to launch a virtual OS from any computer 1/1
- [ ] is a table that does not really exist
- [ ] is a way to reduce my carbon footprint

Question 15 The graph from Figure 1 should be integrated in a report about the weather conditions in Haut-Rhin. What are the anomalies of this graph ?
- [x] Uncertainties are not shown
- [ ] The scale of the data is not good
- [x] Titles of the X and Y axis are missing 1/1
- [ ] The type of graph is not the right one
- [x] You have to remove the caption of the graph

Question 16 According to the simplified model from Von Neumann, which parts of the computer works by pairs ? Selon le model simplifié de Von Neumann, quelles parties de l'ordinateur fonctionnent par paires ?
- [x] Computing unit
- [ ] Central unit
- [ ] Bus
- [x] Control unit
- [ ] Motherboard 1/1

3 Computation

Only one correct answer per question.
Rating scale : a correct answer is worth 2, the lack of answer is worth 0 and an incorrect answer is worth -1.

3.1 Base change and two's complement

Question 17 The binary coding on 8 bits of -84_{10} is (signed on 8 bits) :
- [ ] 1010 1011
- [ ] 1101 0100
- [ ] The question is wrong
- [ ] 0101 0100 2/2
- [x] *None of these answers is correct.*

Question 18 What is the two's complement of 0011 0000 (on 8 bits) ?

☐ 1101 0001 ☐ The question is wrong
☒ 1101 0000 ☐ 0110 0000 ☐ 1011 0000 2/2
☐ *None of these answers is correct.*

Question 19 What is the hexadecimal representation of -93_{10} (signed on 8 bits) ?

☐ The question is wrong ☒ A3 ☐ -5D 2/2
☐ 5D ☐ *None of these answers is correct.*

Question 20 What is the representation in base 16 (unsigned on 16 bits) of 455_{10} ?

☐ $0000\ 0001\ 1010\ 0111_{16}$ ☐ $01\ C6_{16}$
☐ The question is wrong 2/2
☐ $0000\ 0001\ 1100\ 0111_{16}$
☒ *None of these answers is correct.*

Question 21 What is the representation in base 10 of the following signed integer : $1100\ 0111_2$

☒ -57 ☐ 53 ☐ -89
☐ The question is wrong 2/2 ☐ 57
☐ *None of these answers is correct.*

Question 22 What is the representation in base 10 of $F2_{16}$ (non-signed on 8bits) ?

☒ 242 ☐ The question is wrong ☐ -14 2/2
☐ *None of these answers is correct.*

3.2 Multiple interpretations

Given the following binary sequence on 8 bits :
1000 0110
Answer the 3 following questions :

Question 23 Assuming it is the binary representation of a signed integer, what is its representation in base 16 ?

☒ 86 ☐ 6 ☐ 206 ☐ -86 1/2
☐ *None of these answers is correct.*

Question 24 Assuming it is the binary representation of a signed integer, what is its representation in base 10 ?

☐ 122 ☐ -121 ☐ 134 ☐ 121 2/2
☒ *None of these answers is correct.*

Question 25 Assuming it is the binary representation of an unsigned integer, what is its representation in base 10 ?

☐ -7 ☒ 134 ☐ 7 ☐ -134 2/2
☐ *None of these answers is correct.*

4 Open questions

Rating scale : a correct answer is worth 2, the lack of answer is worth 0 and an incorrect answer is worth -0.5.

4.1 Unsigned integers on 8 bits

Question 26
$$\begin{array}{r} 0110\ 0111 \\ +\ 1011\ 0110 \\ \hline ? \end{array}$$
2/2

Question 27
$$\begin{array}{r} 0100\ 1010 \\ +\ 0101\ 1111 \\ \hline ? \end{array}$$
2/2

Question 28
$$\begin{array}{r} 0011\ 1000 \\ -\ 0101\ 1100 \\ \hline ? \end{array}$$
2/2

Question 29
$$\begin{array}{r} 1111\ 0101 \\ \times\ 0011\ 0111 \\ \hline ? \end{array}$$
0/2

Question 30
$$\begin{array}{r} 0100\ 0110 \\ /\ 0010\ 0000 \\ \hline ? \end{array}$$
2/2

Question 31
$$\begin{array}{r} 0100\ 0100 \\ \times\ 0010\ 0101 \\ \hline ? \end{array}$$
2/2

Question 32
$$\begin{array}{r} 0000\ 1000 \\ \times\ 1101\ 1101 \\ \hline ? \end{array}$$
2/2

Question 33
$$\begin{array}{r} 0100\ 1011 \\ -\ 0011\ 0100 \\ \hline ? \end{array}$$
2/2

4.2 Floating point conversion

Question 34 What is the encoding in simple precision float (IEEE 754 standard) of **56.8** ? *(Reminder : do not write notes on your copy, use a draft.)*

-0.5/2

Question 35 What is the encoding in simple precision float (IEEE 754 standard) of **35.3125** ? *(Reminder : do not write notes on your copy, use a draft.)*

0/2