IN1006 Systems Architecture (PRD1 A 2022/23)

Started on	Thursday, 10 November 2022, 6:10 PM
State	Finished
Completed on	Thursday, 10 November 2022, 6:18 PM
Time taken	7 mins 53 secs
Grade	**6.00** out of 10.00 (**60**%)

Question **1**

Incorrect

Mark 0.00 out of 3.00

Which of the following binary numbers corresponds to the result of the following subtraction of hexadecimal numbers (hint: transform the hexadecimal numbers to binary and perform subtraction as addition of the 2's complement the number to be subtracted):

66_{hex} - 22_{hex}

- a. 0100 0100
- b. 0000 1001
- c. 0000 1111
- d. 1111 0010
- e. 0010 1001

✖ Incorrect answer.

Your answer is incorrect.

The binary form of 66_{hex} is: 0110 0110

The binary form of 22_{hex} is: 0010 0010

Subtracting 22_{hex} from 62_{hex} can be carried out by adding the 2's complement of 22_{hex} to 62_{hex}.

To find the 2's complement of 22_{hex} we first flip the bits of its binary representation. This gives us: 1101 1101 (flip bits)

And then we add 1, so we get:

1101 1101

\+ 1

This gives us:

1101 1110 (i.e., the 2's complement of 22_{hex})

Then we perform the addition:

0110 0110 (62_{hex})

\+ 1101 1110 (i.e., the 2's complement of 22_{hex})

The result of this addition is

0100 0100

and as the left most bit is 0 the number is a positive one and therefore it constitutes the answer.

The correct answer is:
0100 0100

Question **2**

Correct

Mark 1.00 out of 1.00

What is the correct hexadecimal representation for the binary number 11110110? You do not need to give the subscript (h). All possible answers below are in hexadecimal representation.

Select one:

- a. Don't know/no answer
- b. E6
- c. D6
- d. F1
- e. F6 ✔
- f. 87

The most straightforward approach is to consider the binary word four bits at a time as shown in the table.

Binary	1111	0110
Hexadecimal	F	6

The correct answer is: F6

Question **3**

Correct

Mark 1.00 out of 1.00

What are the binary and decimal representations of the hexadecimal number F4?

Select one:

- a. Don't know/No answer
- b. Binary: 11100100 Decimal: 244
- c. Binary: 11110100 Decimal: 244 ✔
- d. Binary: 11110100 Decimal: 240
- e. Binary: 11110010 Decimal: 244

Your answer is correct.

To convert from base 16, we remember that $F4_h$ means

F x 16^1 + 4 x 16^0

15 x 16 + 4 x 1

240 + 4

244_{10}

The correct answer is: Binary: 11110100 Decimal: 244

Question **4**

Incorrect

Mark 0.00 out of 1.00

Which of the following numbers is the binary number representing 15 in the decimal system (select one answer)?

- a. 0 0 0 1 1 1 1 1
- b. None of the rest of the choices
- c. 1 1 0 0 1 1 1 1
- d. 0 0 0 0 1 1 1 1
- e. 0 0 0 0 0 0 0 0

✖ Not correct. The correct answer is 0 0 0 0 1 1 1 1

Your answer is incorrect.

The correct answer is:
0 0 0 0 1 1 1 1

Question **5**

Correct

Mark 1.00 out of 1.00

What is the numeric range of an 4-bit signed magnitude binary number?

Select one:

- a. -255...256
- b. -127...127
- c. 0...7
- d. 0...255
- e. None of the listed options. ✔
- f. -128 ... 127

Your answer is correct.

The correct answer is: None of the listed options.

Question **6**

Correct

Mark 1.00 out of 1.00

What is the correct hexadecimal representation for the binary number 11110110? You do not need to give the subscript (h). All possible answers below are in hexadecimal representation.

Select one:

- a. E6
- b. 87
- c. D6
- d. F6 ✔
- e. Don't know/no answer
- f. F1

Your answer is correct.

The most straightforward approach is to consider the binary word four bits at a time as shown in the table.

Binary	1111	0110
Hexadecimal	F	6

The correct answer is: F6

Question **7**

Correct

Mark 1.00 out of 1.00

Which of the following numbers is the octal number representing number 42 in the decimal system (select one answer)?

- a. 56
- b. 40
- c. 52 ✔ Correct.
- d. 44
- e. 39

Your answer is correct.

The correct answer is:
52

Question **8**

Correct

Mark 1.00 out of 1.00

What are the binary and decimal representations of the hexadecimal number F4?

Select one:

- a. Binary: 11110100 Decimal: 240
- b. Binary: 11110100 Decimal: 244 ✔
- c. Binary: 11110010 Decimal: 244
- d. Don't know/No answer
- e. Binary: 11100100 Decimal: 244

To convert from base 16, we remember that $F4_h$ means

F x 16^1 + 4 x 16^0

15 x 16 + 4 x 1

240 + 4

244_{10}

The correct answer is: Binary: 11110100 Decimal: 244

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