IN1006 Systems Architecture (PRD1 A 2022/23)

Started on	Thursday, 10 November 2022, 4:34 PM
State	Finished
Completed on	Thursday, 10 November 2022, 4:40 PM
Time taken	5 mins 48 secs
Grade	**10.00** out of 10.00 (**100**%)

Question **1**

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

Your answer is correct.

The correct answer is:
52

Question **2**

Correct

Mark 1.00 out of 1.00

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

Select one:

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

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 **3**

Correct

Mark 3.00 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):

AE_{hex} - 94_{hex}

- a. 0000 0101
- b. 0100 1010
- c. 0011 1010
- d. 0001 1010 ✔ This is the correct answer.
- e. 0110 0100

Your answer is correct.

The binary form of AE_{hex} is: 1010 1110

The binary form of 94_{hex} is: 1001 0100

Subtracting 94_{hex} from AE_{hex} can be carried out by additing the 2's complement of 94_{hex} to AE_{hex}.

To find the complement of 94_{hex} we first flip the bits of its binary representation. This gives us: 0110 1011 (flip bits)

And then we add 1, so we get:

0110 1011

\+ 1

This gives us:

0110 1100 (i.e., the 2's complement of 94_{hex})

Then we perform the addition:

1 0 1 0 1 1 1 0 AE_{hex}

0 1 1 0 1 1 0 0 (addition of 2's complement of 94_{hex})

The result of this addition is

0001 1010

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

The correct answer is:
0001 1010

Question **4**

Correct

Mark 1.00 out of 1.00

In performing a bit-wise addition of the following unsigned binary numbers, how many "carry out" bits will be generated?

1 0 0 0 1 0 1 1

0 1 1 1 0 0 0 1

a. 4 "carried out" bits will be produced.

b. 1 "carried out" bits will be produced.

c. 2 "carried out" bits will be produced. ✔ Correct. The two carry out bits will be produced when adding two right most pairs of bits of the given numbers.

d. 0 "carried out" bits will be produced.

e. 3 "carried out" bits will be produced.

Your answer is correct.

The correct answer is:
2 "carried out" bits will be produced.

Question **5**

Correct

Mark 1.00 out of 1.00

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

Select one:

a. Binary: 11100100 Decimal: 244

b. Binary: 11110100 Decimal: 244 ✔

c. Binary: 11110100 Decimal: 240

d. Binary: 11110010 Decimal: 244

e. Don't know/No answer

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 **6**

Correct

Mark 1.00 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. 1 1 0 0 1 1 1 1
- c. 0 0 0 0 1 1 1 1 ✔ Correct.
- d. None of the rest of the choices
- e. 0 0 0 0 0 0 0 0

Your answer is correct.

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

Question **7**

Correct

Mark 1.00 out of 1.00

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

Select one:

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

Your answer is correct.

The correct answer is: None of the listed options.

Question **8**

Correct

Mark 1.00 out of 1.00

Which of the following 8-bit binary numbers represents number 77 in the decimal system (select one answer)?

a. 0 1 1 0 1 1 0 0

b. 0 1 0 0 1 1 0 1 ✔ Correct answer.

c. None of the rest of the choices

d. 1 1 1 0 1 0 1 0

e. 1 1 0 0 1 1 0 1

Your answer is correct.

The correct answer is:

0 1 0 0 1 1 0 1

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