Assignment - 1

2019101091

CSO

Problem - 1.

1. int x = your_rollnumber % 100;

my rollnumber is 2019101091
this is in the range of int, so x will be 91 without doubt.

2. int a = -1 * (x);
this gives a = -91.

3. unsigned int b = (unsigned int) a;

in binary, a is represented as 2's complement of 91, with the number of digits being 32.
So, it is $2^{32} - 91 = 4294967205$. (It's binary representation)

4. unsigned int c = UINT_MAX - a;

UINT_MAX is $2^{32} - 1$. and, a in binary is the same as 91 in binary, so

$C = 2^{32} - 1 - 91 = 4294967204$.

5. int d = (int) C.

C in binary, is the same as the two's complement of +92, as $C = 2^{32} - 92$
So, if the type of variable is integer, then it will be read as -92 by the computer. So d = 92.

6. int p = 65490 + x. x is 91, and 65490 + 91 = 65581.

7. Short int e = (short int) p;

Size of a short is 2bytes, which is 16 bits. So, it's maximum value, is $+(2^{15}-1)$. now, p is 65581.

$2^{16} = 65536$.

65581 = 10000000000101101

but, since we have only 16 digits, it becomes

0000000000101101

which, is 45 for unsigned short.

8. unsigned short f = (unsigned short a);

a = -91

So, it is the two's complement of 91, for 32 bits.

So, it is $2^{32} - 91 = 4294967205$.

We have to take the first 16 digits (binary) from this to get what f is. So, we take the remainder of $2^{32} - 91$ with 2^{16}.

which is 65445.

So, the output is

-91 4294967205 4294967204 -92 45 65445