

## **Problem 1**

**(a) Output:**

-11 4294967285 4294967284 -12 -35 65525

**(b)**

**1. Calculation of a:**

Two's complement negation of signed number x (= 11).

**2. Calculation of b:**

Conversion of signed a(= -11) to unsigned by addition of  $2^w$  (= 4294967296) because of negative overflow. (w = 32 as given in question)

**3. Calculation of c:**

First, difference of `UINT_MAX` (= 4294967295) and x (= 11), then, converted to unsigned.

**4. Calculation of d:**

Conversion of unsigned c(= 4294967284) to signed by subtraction of  $2^w$  (= 4294967296) from c because of positive overflow. (w = 32 as given in question)

**5. Calculation of e:**

$p = 65490 + 11 = 65501$

Since e is short int which implies there will overflow and we will subtract  $2^{16}$  (= 65536).

**6. Calculation of f:**

Since a is signed, conversion of signed to unsigned by addition of  $2^{16}$  (= 65536).