1 Programming in C and C++ (NK)

(a) Consider the following program, written to test whether the representation of int on a particular architecture uses two’s complement or not.

```c
#include <limits.h>
#include <stdio.h>

int main(void) {
    printf("%d\n", (INT_MAX + 1) < 0);
    return 0;
}
```

Explain what this program is permitted to output, and why. [5 marks]

(b) Consider the following C function, intended to receive a string as an argument and return a reversed string as a result. (The strlen function returns the number of characters in the string.)

```c
#include <string.h>
#include <stdlib.h>

char *reverse(char *input) {
    int len = strlen(input);
    char output[len];
    for (int i = 0; i < len; i++) {
        output[len - i - 1] = input[i];
    }
    return output;
}
```

(i) Identify three bugs in this function. [6 marks]

(ii) Write a correct version of this function. [9 marks]