Question 1

What is the time, space complexity of following code:

```
int a = 0, b = 0;

for (i = 0; i < N; i++) {

a = a + 1;

}

for (j = 0; j < M; j++) {

b = b + j;

}
```

Answer:

The first loop is O(N) and the second loop is O(M). Since we don't know which is bigger, we say this is O(N + M). This can also be written as O(max(N, M)).

Since there is no additional space being utilized, the space complexity is constant O(1).

Question 2

What does it mean when we say that an algorithm X is asymptotically more efficient than Y?

a)X will be a better choice for all inputs

b)X will be a better choice for all inputs except possibly small inputs

c)X will be a better choice for all inputs except possibly large inputs

d)Y will be a better choice for small inputs

Answer: (B)

Explanation: In asymptotic analysis we consider growth of algorithm in terms of input size. An algorithm X is said to be asymptotically better than Y if X takes smaller time than y for all input sizes n larger than a value n0 where n0 > 0.