

## COSC 3304 – Algorithms Design and Analysis

### Assignment 2

**Due: 23:59:00pm, Jan. 30, 2024 (Tuesday)**

1. If  $f(n)=2n^2+n+10$  and  $g(n)=n^2$ , please find  $n_o$  to make  $c_1g(n) \leq f(n) \leq c_2g(n)$  when  $c_1=1$  and  $c_2=3$  (30 points)

2. Please prove

if  $f(n) = \Theta(g(n))$  and  $g(n) = \Theta(h(n))$ , then  $f(n) = \Theta(h(n))$

(35 points)

3. What is the big O notation of the following program by assuming  $n=2^k$  (please show detailed steps for full credits):

```
for (int i=1; i<=n; i*=2)
    for (int j=n; j>=1; j--)
        { //other constant time statements ; }
```

(35 points)