Name:
Student ID:

Computational Complexity & Scaling – IST 441

- Exercise 1: (6 pts) Give the Big O complexity (asymptotic complexity) of the growth of work of each expression below and order the following as to increasing complexity as a function of the work n (all unspecified terms such as (a, k) etc are positive to be determined constants). **For full credit show your reasoning**.

	O(n)	Order	scaling
		(largest to smallest)	

a. $10000 + n + 40 \ \log n$

b. $3 \ n^3 \log n + 8 \ n + 21 \ n^4$

c. $e^n + n^{1000}$

d. $10^3 \ n \log n + \ n^2$

e. $10^4 \ n + 10^{-2} \ n^2$

f. $n! + 2^n$

g. $n \ (\log n)^3 + n + n^2$

h. $(\log n)^n + n^{\log n}$

i. $0.1 \ n + 10 \ k^n$

j. a^{kn}

- Label each as reasonable/unreasonable and practical/impractical for scaling.