

Name:
Student ID:

Computational Complexity – IST 511

- Exercise 1: (5 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 k are to be positive to be determined constants). For full credit show your reasoning.

O(n)

Order (from most complex to least)

- a. $0.1 + n + 40 \log n$
- b. $3 n^3 \log n + 8 n + 21 n^4$
- c. $e^n + n^{1000}$
- d. $10^2 n \log n + n^2$
- e. $10^3 n + 10^{-2} n^2$
- f. $n! + 2^n$
- g. $n (\log n)^3 + n + n^2$
- h. $n! + \log n^n$
- i. $10^6 + 10^{-3} \log n$
- j. $0.1 n + 10 k^n$

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