COM 315: ALGORITHMS CAT $1_{1/2}$ HRS

N/B: ATTEMPT ALL THE QUESTIONS 2/2/2020

Q1

a) Describe the asymptotic notation and discuss one advantage of using asymptotic notations to analyze algorithms (5 Marks)

b) Discuss how a Divide-and-Conquer algorithm works and state the nature of problems that can be solved using this approach (6 Marks)

c) Write the recursive binary search algorithm (6 Marks)

d) Determine the running time of the binary search algorithm in part (c) above (3 Marks)

Q2

Discuss the Greedy approach to problem solving and briefly discuss the components of a greedy algorithm (4 Marks)

a) Discuss the activity selection problem (1 Marks)

b) Write the greedy solution to the activity selection problem (2 Marks)

c) Describe the incremental paradigm, state a problem that can be solved using this paradigm and write the algorithm for the problem chosen (3 Marks)

Q3

a) Find the shortest path from node 1 to all other nodes using Dijkstras algorithms (5 marks)