First Name: Last Name: Section:

This answer sheet is for the 4:30pm section only. Submitting to the wrong section will receive a zero.

Q1: Read the instructions for question Q1 in the question document. **For each of the three sub-questions, write your answer to the question in the given space**.

(a): After the extract-min operation, we have

A[2]=

A[3]=

A[5]=

A[6]=

A[12]=

(b): After the decrease-key operation, we have

A[1]=

A[2]=

A[3]=

A[5]=

A[10]=

(c): After the insertion operation, we have

A[1]=

A[2]=

A[3]=

A[6]=

A[13]=

Q2: Read the instructions for question Q2 in the question document. **For each of the three sub-questions, write your answer to the question in the given space**.

(a): After performing union(8, 16), we have

A[1]=

A[5]=

A[7]=

A[13]=

A[16]=

(b): After performing union(10, 14), we have

A[1]=

A[9]=

A[10]=

A[13]=

A[14]=

(c): After performing find-set(8) and find-set(10), we have

A[5]=

A[7]=

A[8]=

A[9]=

A[10]=

Q3: Read the instructions for question Q3 in the question document. **For each of the three sub-questions, write your answer to the question in the given space**.

(a): After the DFS on G, the discovery times for vertices $3, 5, 7$ are

$3.dsc=$

$5.dsc=$

$7.dsc=$

(b): After the DFS on G, the finish times for vertices $2, 4, 6$ are

$2.fin=$

$4.fin=$

$6.fin=$

(c): After the DFS on G, th predecessors for vertices $2, 3, 6$ are

$2.\pi=$

$3.\pi=$

$6.\pi=$

Q4: Read the instructions for question Q4 in the question document. **For each of the two sub-questions, write your answer to the question in the given space**.

(a): After the BFS on G, the distances of vertices $2, 3, 4$ from vertex 1 are

$2.d=$

$3.d=$

$4.d=$

(b): After the BFS on G, the predecessors of vertices $5, 6, 7$ are

$5.\pi$=

$6.\pi$=

$7.\pi$=

Q5: Read the instructions for question Q5 in the question document. **For each of the two sub-questions (each with 10 entries), answer the question by entering the values into the corresponding boxes**.

(a): **Immediately before** vertex 3 is deleted from the priority queue, we have

$1.d =$

$1.\pi =$

$2.d =$

$2.\pi =$

$3.d =$

$3.\pi =$

$6.d =$

$6.\pi =$

$7.d =$

$7.\pi =$

(b): **Immediately before** vertex 5 is deleted from the priority queue, we have

$1.d =$

$1.\pi =$

$2.d =$

$2.\pi =$

$3.d =$

$3.\pi =$

$6.d =$

$6.\pi =$

$7.d =$

$7.\pi =$

Q6: Read the instructions for question Q6 in the question document. **For each of the two sub-questions (each with 10 entries), answer the question by entering the values into the corresponding boxes**.

(a): **Immediately before** vertex 1 is deleted from the priority queue, we have

$2.key =$

$2.\pi =$

$3.key =$

$3.\pi =$

$6.key =$

$6.\pi =$

$7.key =$

$7.\pi =$

$8.key =$

$8.\pi =$

(b): **Immediately before** vertex 8 is deleted from the priority queue, we have

$2.key =$ [ ]

$2.\pi =$ [ ]

$3.key =$ [ ]

$3.\pi =$ [ ]

$6.key =$ [ ]

$6.\pi =$ [ ]

$7.key =$ [ ]

$7.\pi =$ [ ]

$8.key =$ [ ]

$8.\pi =$ [ ]