

✓ **¡Felicitaciones! ¡Aprobaste!**

Calificación recibida **100 %** Para Aprobar 70 % o más

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## Final Exam

Calificación de la entrega más reciente: 100 %

1. Consider a directed graph  $G = (V, E)$  with non-negative edge lengths and two distinct vertices  $s$  and  $t$  of  $V$ . Let  $P$  denote a shortest path from  $s$  to  $t$  in  $G$ . If we add 10 to the length of every edge in the graph, then: [Check all that apply.]

2 / 2 puntos

✓ **Correcto**

2. What is the running time of depth-first search, as a function of  $n$  and  $m$ , if the input graph  $G = (V, E)$  is represented by an adjacency matrix (i.e., NOT an adjacency list), where as usual  $n = |V|$  and  $m = |E|$ ?

2 / 2 puntos

✓ **Correcto**

3. What is the asymptotic running time of the Insert and Extract-Min operations, respectively, for a heap with  $n$  objects?

2 / 2 puntos

✓ **Correcto**

4. On adding one extra edge to a directed graph  $G$ , the number of strongly connected components...?

2 / 2 puntos

✓ **Correcto**

5. Which of the following statements hold? (As usual  $n$  and  $m$  denote the number of vertices and edges, respectively, of a graph.) [Check all that apply.]

2 / 2 puntos

✓ **Correcto**

6. When does a directed graph have a unique topological ordering?

2 / 2 puntos

✓ **Correcto**

7. Suppose you implement the operations Insert and Extract-Min using a *sorted* array (from biggest to smallest). What is the worst-case running time of Insert and Extract-Min, respectively? (Assume that you have a large enough array to accommodate the Insertions that you face.)

2 / 2 puntos

✓ **Correcto**

8. Which of the following patterns in a computer program suggests that a heap data structure could provide a significant speed-up (check all that apply)?

2 / 2 puntos

✓ **Correcto**

9. Which of the following patterns in a computer program suggests that a hash table could provide a significant speed-up (check all that apply)?

2 / 2 puntos

✓ Correcto

10. Which of the following statements about Dijkstra's shortest-path algorithm are true for input graphs that might have some negative edge lengths? [Check all that apply.]

2 / 2 puntos

✓ Correcto