Exam 2 Key

1. True
2. True
3. False : It might get lucky
4. Exponential
5. Dijkstra Algorithm
6. Dijkstra Time
    a. P-Queue – n^2 or O(N^2)
    b. Heap – m log n -> m edges, n vertices or O(M + NlogN) or O(|E| + |V|log|V|)

7a)

Iter	Final	A	B	C	D	E	F	G	H	I
-	None	(0,None)	(∞,None)	(∞,None)	(∞,None)	(∞,None)	(∞,None)	(∞,None)	(∞,None)	(∞,None
1	A	-	(4,A)	(8,A)	(∞,None)	(∞,None)	(∞,None)	(∞,None)	(∞,None)	(∞,None
2	B	-	-	(8,A)	(12,B)	(∞,None)	(∞,None)	(∞,None)	(∞,None)	(∞,None
3	C	-	-	-	(12,B)	(15,C)	(9,C)	(∞,None)	(∞,None)	(∞,None
4	F	-	-	-	(12,B)	(15,C)	-	(∞,None)	(11,F)	(∞,None
5	H	-	-	-	(12,B)	(15,C)	-	(∞,None)	-	(∞,None
6	D	-	-	-	-	(15,C)	-	(19,D)	-	(∞,None
7	E	-	-	-	-	-	-	(19,D)	-	(∞,None
8	G	-	-	-	-	-	-	-	-	(28,G)
9	-	-	-	-	-	-	-	-	-	-

(ii) A,B,C,F,H,D,E,G,I

(iii)A,C,F,H

b)

(ii) A,B,C,F,H,D,E,G,I

(iii)A,C,F,H

(b) When is a vertex's sum weight finalized in Dijkstras algorithm?

A vertex is finalized when it has the lowest cost compared to all others

(c) What role does the priority queue play in finding the shortest path? When do we use it?

The priorty queue helps to pick the minimum cost vertex from the list of vertics efficiently. If two elements have the same priority, they are served according to their order in the queue.

8)

A	F, B
B	-
C	C, B, D
D	D, C, F
E	A, D
F	B, D, E

BFS- answer A
DFS – Answer C

9) graph

10)

11) O(M+N) dfs

12) there is a cycle

13) grid stack hbox vbox border

14) fires an actionEvent

15) button.setOnAction(event-> {System.out.println("action!)});

16) NumberFormat Exception, Also in SomethingBad missing a throws clause

17) Finally

18) isGoal() – if all nodes colored != null;
isValid() – for each node, no neighbor is same color as me
getSucessors() – generates all the colors I can be

19) Using the list of successors if one doesn't generate a solution try one of my previous successors see if it does.