Practice Quiz 2 (Multiple Choice)

Due Jun 10 at 11:59pm **Points** 30 **Questions** 24
Available May 21 at 12am - Jun 10 at 11:59pm 21 days **Time Limit** None **Allowed Attempts** 2

This quiz was locked Jun 10 at 11:59pm.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	128 minutes	27.67 out of 30

Correct answers are hidden.

Score for this attempt: **27.67** out of 30
Submitted May 17 at 2:18am
This attempt took 128 minutes.

Question 1

3 / 3 pts

Suppose we have an alphabet with only five letters A, B, C, D , E which occur with the following frequencies:

- A = 51, B = 10, C = 8, D = 12, E = 19

Construct a Huffman code using the following guidelines while constructing the code

- the lowest frequency node is the left child in the tree while the higher frequency node is the right child
- when creating the code the left branch is assigned a 0 while the right branch is assigned a 1.

The Huffman binary coding is:

- A = 11, B = 110, C = 010, D = 1100, E = 0011
- A = 1, B = 0111, C = 0110, D = 101, E = 11
- A = 1, B = 0111, C = 0110, D = 010, E = 00
- A = 0, B = 11, C = 10, D = 11, E = 111
- A = 0, B = 1,1, C = 1001, D = 101, E = 1000

Question 2

1 / 1 pts

All dynamic programming problems can be solved by using a greedy choice algorithm.

- True
- False

Question 3

1 / 1 pts

Which of the following is an example where the greedy method does not achieve the optimal solution to the Coin Change problem. D is the set of denominations and A is the amount to make change.

- D = { 1, 5, 10, 25} and A = 30
- D = { 1, 7, 11} and A = 14
- D = { 1, 7, 11} and A = 22
- D = { 3, 8, 13, 25} and A = 53
- D = {1, 5, 10, 25, 50 } and A = 52

Incorrect

Question 4

0 / 1 pts

Consider the following greedy choice strategies to solve the activity-selection problem of section 16.1 in CLRS.

Select the compatible activity with :

1. the earliest start time.
2. the shortest total time.
3. the fewest conflicts.
4. the latest finishing time.

5. the latest start time.

Which strategy is guaranteed to result in an optimal solution.

- 1
- 2
- 3
- 4
- 5

Question 5

1 / 1 pts

Consider weights and values of items below and a knapsack that can hold at most 20 lbs.

Item	Value in $	Weight in lbs
1	15	10
2	30	15
3	48	12
4	25	5
5	12	4

Assume that each item can be used at most once and **can be broke**n. What is the maximum value of items that can be placed in the knapsack.

- ○ 90
- ○ 85
- ◉ 82
- ○ 87
- ○ None of the above

Partial

Question 6

0.67 / 1 pts

Which of the following problems can not be solved using a greedy algorithm? Select all that apply

- ☐ 0-1 Knapsack
- ☐ Huffman codes
- ☐ Fractional Knapsack
- ☑ Subset Sum
- ☑ Rod-cutting

Question 7

1 / 1 pts

Given two vertices s and t in a connected graph G, which of the two traversals, BFS and DFS can be used to find if there is a path from s to t?

- Only DFS
- Only BFS
- Both BFS and DFS
- Neither BFS nor DFS

Incorrect

Question 8

0 / 1 pts

Let T be a complete binary tree with n vertices . Finding a shortest path (measured by number of edges) from the root of T to a given vertex v ∈ T takes

- O(n)
- O(lgn)

- O(n^2)
- O(nlgn)

Question 9

1 / 1 pts

Let G be a graph with n vertices and m edges. Assume that the graph is represented by an adjacency matrix. What is the tightest upper bound on the running time of DFS performed on G?

- O(n^2)
- O(m+n)
- O(mn)
- O(m)
- O(n)

Question 10

1 / 1 pts

Every directed acyclic graph has exactly one topological ordering.

- ○ True
- ◉ False

Question 11

3 / 3 pts

Given a weighted directed graph G = (V,E,w) and a shortest path P from s to t, if we doubled the weight of every edge to produce G'=(V,E,w'), then P is also a shortest path in G'.

- ◉ True
- ○ False

Question 12

1 / 1 pts

Dijkstra's algorithm may not terminate with the correct distances if the graph contains negative-weight cycles.

- ◉ True
- ○ False

Question 13

1 / 1 pts

In an undirected graph with edge weights that are all 1, a DFS from vertex s to some vertex t will always produce a shortest path from s to t.

- ○ True
- ◉ False

Question 14

1 / 1 pts

In an undirected weighted graph with distinct edge weights, the lightest edge is in the MST.

- ◉ True
- ○ False

Question 15

1 / 1 pts

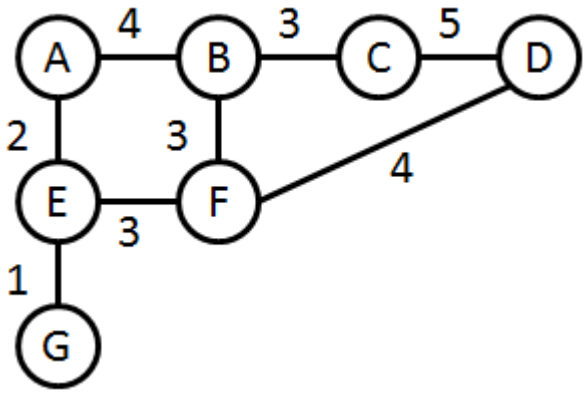
In an undirected weighted graph the heaviest edge is never in the MST.

- ○ True
- ◉ False

Question 16

1 / 1 pts

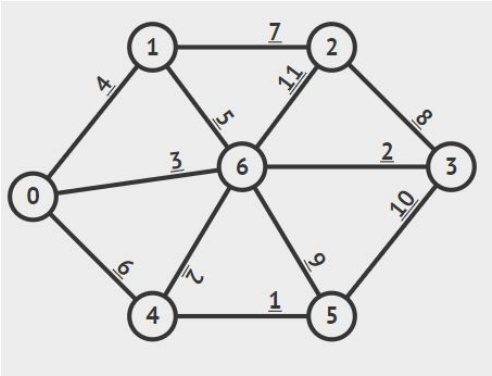
What is the weight of the MST for the graph below? Give strictly a numeric answer.



16

Question 17

1 / 1 pts

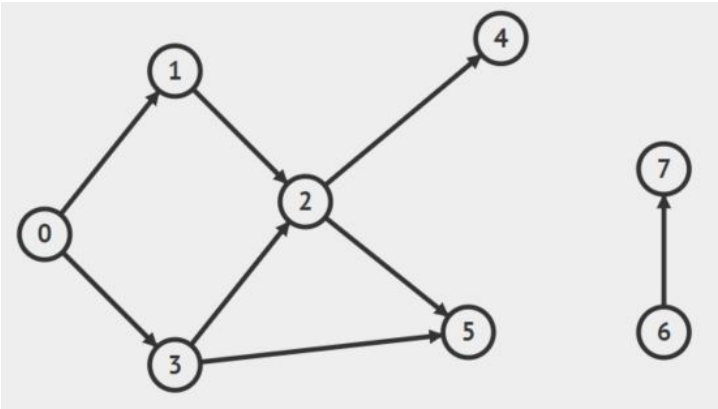


In the above graph, what is the weight of the MST?

19

Question 18

1 / 1 pts

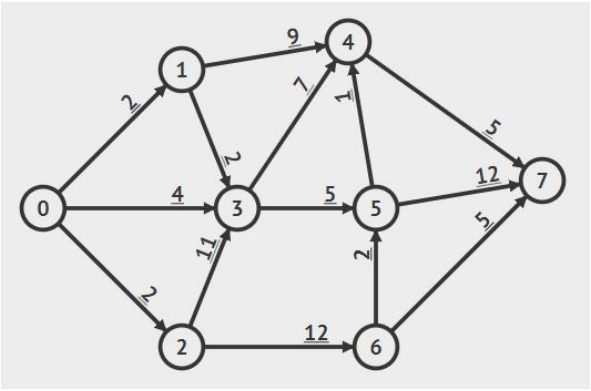


Which of the following is a topological sort of the graph above.

- 7, 6, 5, 2, 4, 3, 1, 0
- 6, 7, 0, 1, 3, 2, 5, 4
- 0, 1, 2, 3, 4, 5, 6, 7
- 0, 3, 2, 5, 1, 4, 6, 7
- None of the above

Question 19

1 / 1 pts

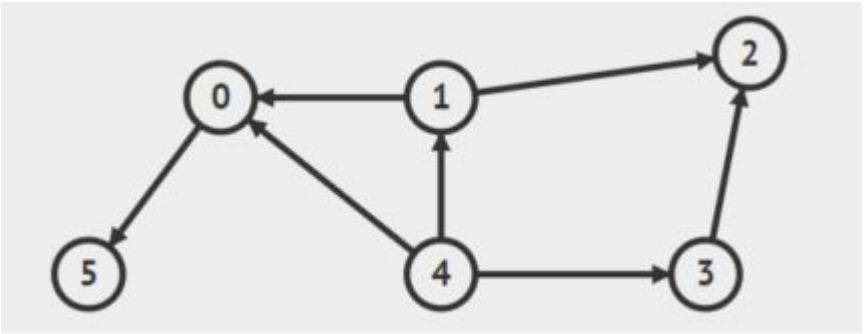


In the graph above, the shortest path from vertex 0 to vertex 7 has weight of

- 21
- 19
- 15
- 16

Question 20

1 / 1 pts

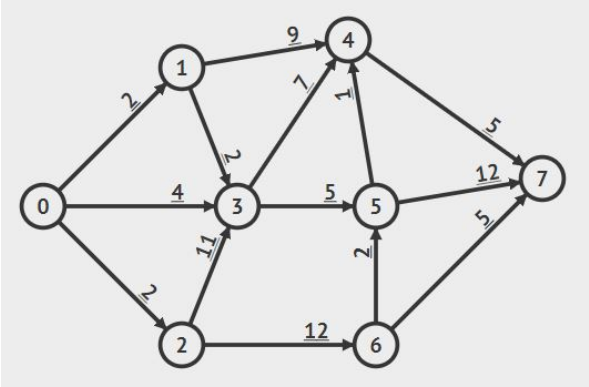


A Breadth First Search Algorithm has been implemented using a queue data structure. One possible order of visiting the vertices of the graph above is:

- 0, 5, 4, 1, 2
- 4, 1, 0, 5, 2, 3
- 4, 0, 1, 3, 5, 2
- 1, 0, 5, 2, 4, 3

Question 21

1 / 1 pts



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Question 22

3 / 3 pts

Given a weighted directed graph G = (V,E,w) and a shortest path P from s to t, if we doubled the weight of every edge to produce G'=(V,E,w'), then P is also a shortest path in G'.

- True

False

Question 23

1 / 1 pts

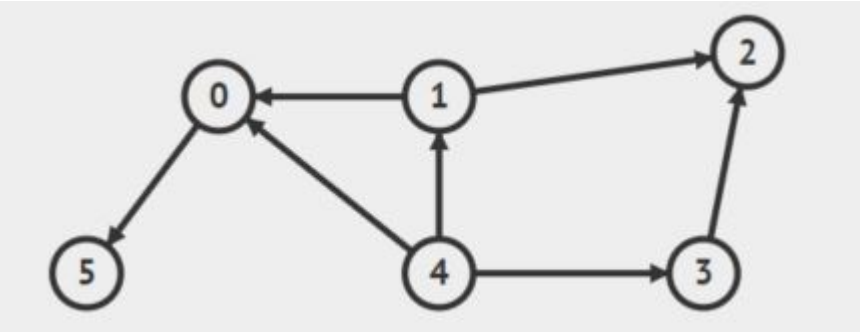
Dijkstra's algorithm may not terminate with the correct distances if the graph contains negative-weight cycles.

True

False

Question 24

1 / 1 pts



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- 4, 1, 0, 5, 2, 3
- 4, 0, 1, 3, 5, 2
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Quiz Score: **27.67** out of 30

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