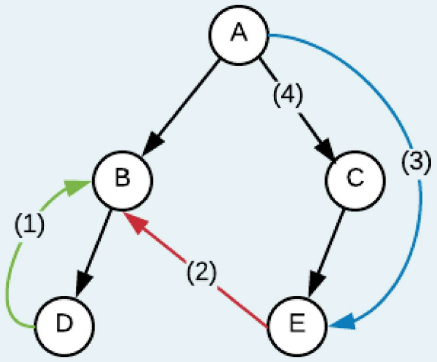
Started on	Sunday, 21 May 2023, 8:33 PM
State	Finished
Completed on	Sunday, 21 May 2023, 8:56 PM
Time taken	22 mins 55 secs
Grade	**8.50** out of 10.00 (**85**%)

Question 1

Partially correct

Mark 0.50 out of 1.00



Match the edges with the appropriate type of edge.

Black Edges (4)	Forward Edge ✗
Green Edge (1)	Back Edge ✓
Blue Edge (3)	Tree Edge ✗
Red Edge (2)	Cross Edge ✓

The correct answer is: Black Edges (4) → Tree Edge, Green Edge (1) → Back Edge, Blue Edge (3) → Forward Edge, Red Edge (2) → Cross Edge

Question 2

Correct

Mark 1.00 out of 1.00

Which of the following is true about Prim's algorithm?

Select one:

- a. It is a Greedy algorithm ✔
- b. It is a Divide and conquer algorithm
- c. It uses Dynamic Programming
- d. None of the statements statements are true

Your answer is correct.

The correct answer is:
It is a Greedy algorithm

Question 3

Correct

Mark 1.00 out of 1.00

Take a complete graph G with 5 vertices. Each edge is of the same weight. Then how many minimum spanning trees are there for graph G?

Answer: 125 ✔

A complete graph with n vertices has $n^{(n-2)}$ spanning trees.

The correct answer is: 125

Question 4

Correct

Mark 1.00 out of 1.00

When using Kruskal's algorithm, what data structure is most suitable to keep track of the sets of vertices in the growing MST?

- a. Disjoint Set Union (DSU) ✔
- b. Stack
- c. Priority Queue
- d. Queue

Your answer is correct.

The correct answer is:
Disjoint Set Union (DSU)

Question 5

Correct

Mark 1.00 out of 1.00

MST can be either acyclic or cyclic depending on the original graph

Select one:

- True
- False ✔

The correct answer is 'False'.

Question 6

Correct

Mark 1.00 out of 1.00

Which of the following algorithms is a greedy algorithm used to find the Minimum Spanning Tree of a graph?

- a. Prim's Algorithm ✔
- b. Breadth-First Search
- c. Depth-First Search
- d. Dijkstra's Algorithm

Your answer is correct.

The correct answer is:
Prim's Algorithm

Question 7

Correct

Mark 1.00 out of 1.00

Edges of a DFS can be classified as tree edge, back edge, forward edge and cross edge. Which types of edges are present in the DFS of an undirected graph

Select one or more:

- a. Back edges ✔
- b. Cross edges
- c. Forward edges
- d. Tree edges ✔

Your answer is correct.

The correct answers are: Tree edges, Back edges

Question 8

Incorrect

Mark 0.00 out of 1.00

Consider a complete undirected graph with vertex set {0, 1, 2, 3, 4}. W_{ij} entry in the matrix W below is the weight of the edge {i, j}.

In the graph given, what is the minimum possible weight of a path P from vertex 1 to vertex 2 in this graph such that P contains at most 3 edges?

$$W = \begin{pmatrix} 0 & 1 & 8 & 1 & 4 \\ 1 & 0 & 12 & 4 & 9 \\ 8 & 12 & 0 & 7 & 3 \\ 1 & 4 & 7 & 0 & 2 \\ 4 & 9 & 3 & 2 & 0 \end{pmatrix}$$

Select one:

- a. 10
- b. 8
- c. 9
- d. 7 ✖

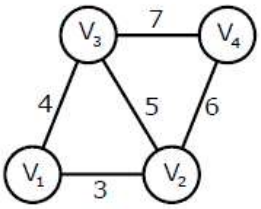
The correct answer is: 8

Question 9

Correct

Mark 1.00 out of 1.00

An undirected graph $G(V, E)$ contains $n(n > 2)$ nodes named $V_1, V_2, V_3 \ldots . V_n$. Two nodes V_i, V_j are connected if and only if $0 < |i - j| <= 2$ Each edge (V_i, V_j) is assigned a weight $i + j$. A sample graph with n=4 is shown below.



What will be the cost of the minimum spanning tree (MST) of such a graph with n nodes?

Select one:

- a. 2n + 1
- b. $6n - 11$
- c. $\frac{1}{12}(11n2 - 5n)$
- d. $n^2 - n + 1$ ✔

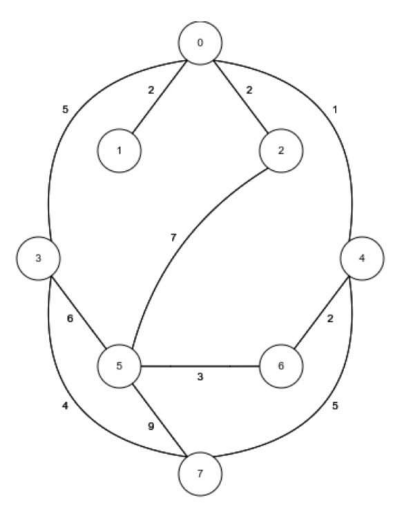
The correct answer is: $n^2 - n + 1$

Question 10

Correct

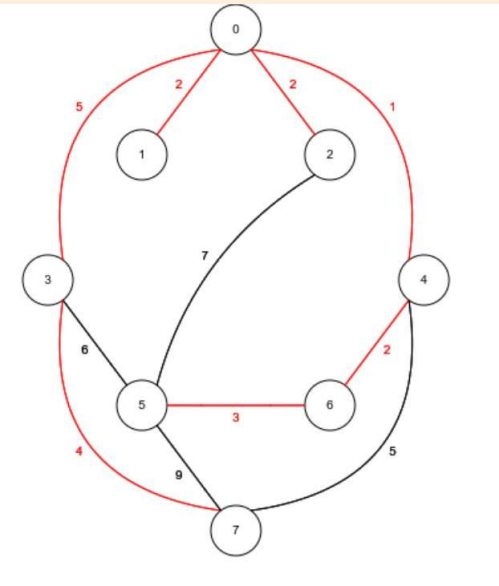
Mark 1.00 out of 1.00

What is the sum of all the weights of the edges in the MST of this graph?



Answer: 19

MST is as follows



The correct answer is: 19