Started on	Tuesday, 14 March 2023, 12:55
State	Finished
Completed on	Tuesday, 14 March 2023, 14:41
Time taken	1 hour 45 mins
Grade	6.17 out of 10.00 (62%)

Question 1

Correct

Mark 1.00 out of 1.00

Match related terms:

vertex [node] ✓

acyclic [tree] ✓

edge [relation] ✓

cycle [path] ✓

Your answer is correct.

The correct answer is:
Match related terms:

vertex [node]

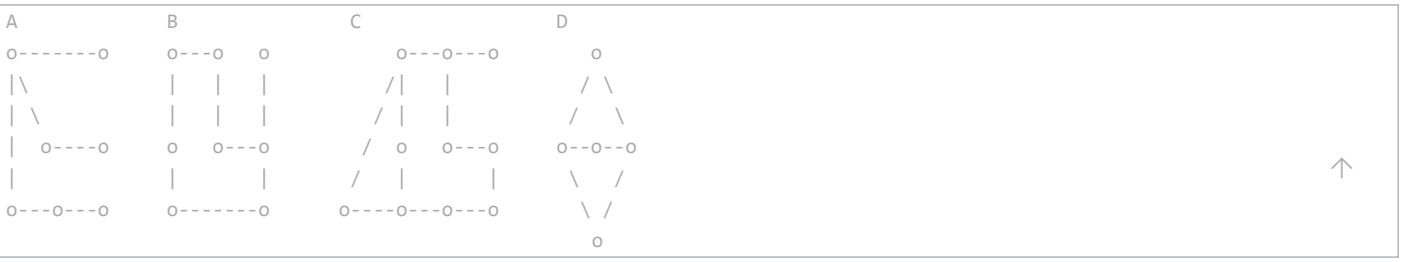
acyclic [tree]

edge [relation]

cycle [path]

Information

The next 5 questions are related to the following four graphs:



Question 2

Partially correct

Mark 0.67 out of 1.00

Which of these graphs are bipartite?

Select one or more:

- [x] A ✓
- [ ] B
- [ ] C
- [x] D ✓

Your answer is partially correct.

You have correctly selected 2.
The correct answers are: A, C, D

Question 3

Correct

Mark 1.00 out of 1.00

Which of these graphs are acyclic?

Select one or more:

- [x] A ✓
- [ ] B
- [ ] C
- [ ] D

Your answer is correct.

The correct answer is: A

Question 4

Partially correct

Mark 0.50 out of 1.00

Which of these graphs have the largest diameter (largest maximum eccentricity of any vertex)?

Select one or more:

- [ ] A
- [ ] B
- [x] C ✓
- [ ] D

Your answer is partially correct.

You have correctly selected 1.
The correct answers are: A, C

Question 5

Correct

Mark 1.00 out of 1.00

Which of these graphs have the smallest radius (smallest minimum eccentricity for any vertex)?

Select one or more:

- [ ] A
- [ ] B
- [ ] C
- [x] D ✓

Your answer is correct.

The correct answer is: D

Question 6

Incorrect

Mark 0.00 out of 1.00

Determine the sum of degrees for graph D.

Answer: 6 ×

The correct answer is: 12

Information

The remaining questions are considering Breadth-First Search (BFS) and Depth-First Search (DFS) in an unweighted graph.

Question 7

Correct

Mark 1.00 out of 1.00

Which of these algorithms can be used to find single-source shortest paths?

Select one:

- Depth-First Search
- Breadth-First Search ✓

Your answer is correct.

The correct answer is: Breadth-First Search

Question 8

Correct

Mark 1.00 out of 1.00

Suppose you use a stack instead of a queue when running breadth-first search. Does it still find shortest paths?

Select one:

- Yes
- No ✓

Your answer is correct.

The correct answer is: No

Question 9

Incorrect

Mark 0.00 out of 1.00

There are many suitable data-structures to represent a graph.

Consider a graph G consisting of some number of vertices V and some number of edges E, where $V = E = 100$.

Match the performance properties to the data-structures:

Most space efficient [Adjacency Set] ×

Slowest to add an edge [Adjacency Matrix] ×

Quickest to check adjacency of two vertices [Adjacency List] ×

[List of Edges]

Your answer is incorrect.

The correct answer is:
There are many suitable data-structures to represent a graph.

Consider a graph G consisting of some number of vertices V and some number of edges E, where $V = E = 100$.

Match the performance properties to the data-structures:

Most space efficient [List of Edges]

Slowest to add an edge [Adjacency Set]

Quickest to check adjacency of two vertices [Adjacency Matrix]

Question 10

Incorrect

Mark 0.00 out of 1.00

Consider the following adjacency list.

```
A | B  C
B | C  D
C | A  B  E
D | B  E
E | D  C
```

Depth-First Search has been running on the graph. The initial call was `dfs(A)`, and after some number of operations has called `dfs(E)`.

How many vertices have been marked just before `dfs(E)`?

Select one:

- 1
- 2
- 3
- 4 ✗

Your answer is incorrect.

The correct answer is: 3