Started on	Saturday, 24 September 2022, 4:21 PM
State	Finished
Completed on	Saturday, 24 September 2022, 4:21 PM
Time taken	9 secs
Marks	0.00/30.00
Grade	**0.00** out of 10.00 (**0**%)

Question **1**

Not answered

Marked out of 1.00

Find the postfix notation of the infix expression

a*d - (b + c)/e

a. a d b c * + e / -

b. * + / - a d b c e

c. - * a d / + e b c

d. a d * b c + e / -

e. None of these

Your answer is incorrect.

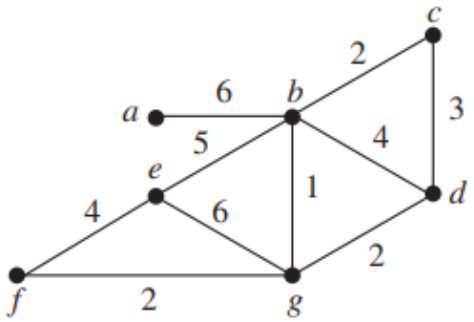
The correct answer is:
a d * b c + e / -

Question 2

Not answered

Marked out of 1.00

What is the total weight of the minimum spanning tree in this graph.



a. 16

b. None of these

c. 17

d. 15

e. 14

Your answer is incorrect.

The correct answer is:
17

Question 3

Not answered

Marked out of 1.00

Build a binary search tree for the words of the sentence

"Life is what happens when you are busy making other plans"

How many comparisons required to locate the word "plans"?

- a. 4
- b. 5
- c. 2
- d. None of these
- e. 3

Your answer is incorrect.

The correct answer is:
5

Question **4**

Not answered

Marked out of 1.00

Build a binary search tree for the words peach, apple, durian, pear, coconut, mango, papaya using alphabetical order.

How many comparisons required to locate the word "mango"?

- a. 2
- b. 3
- c. 4
- d. 5
- e. None of these

Your answer is incorrect.

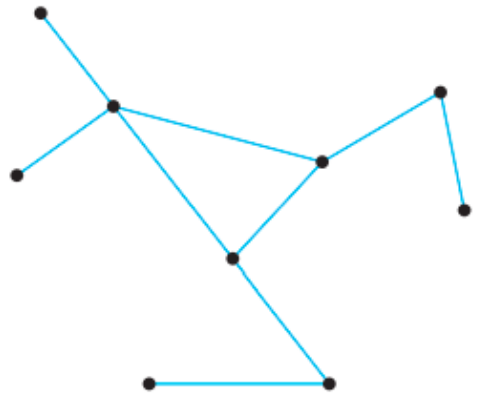
The correct answer is:
4

Question 5

Not answered

Marked out of 1.00

This graph is not a tree.



If we remove one edge from this graph, it will be a tree.

How many choices of edges?

- a. 3
- b. 4
- c. 1
- d. 2

Your answer is incorrect.

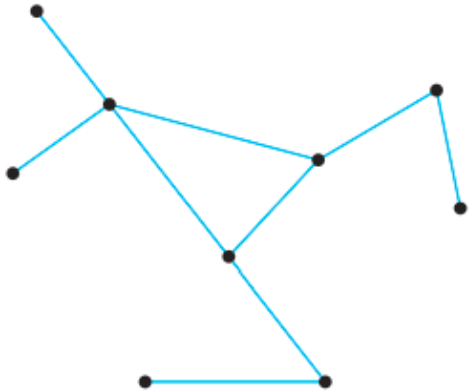
The correct answer is:
3

Question **6**

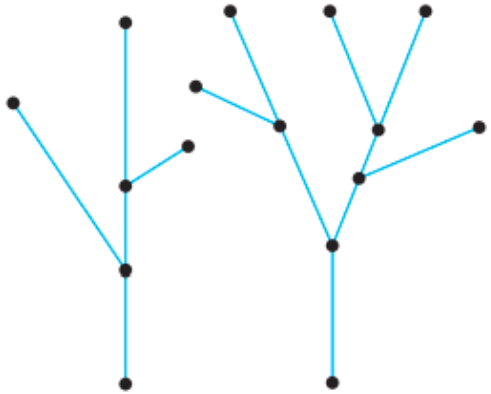
Not answered

Marked out of 1.00

Which graphs are trees?



Graph G



Graph H

- a. Graph H
- b. Graph G
- c. Neither
- d. Both

Your answer is incorrect.

Graph G: has a simple circuit

Graph H: disconnected

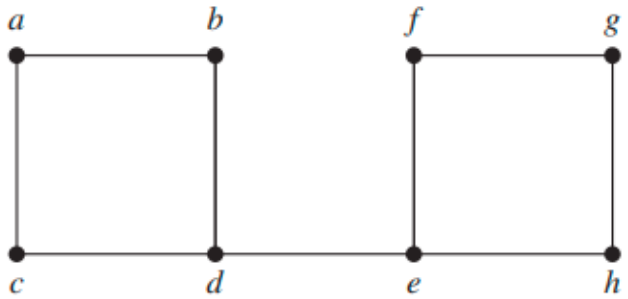
The correct answer is:
Neither

Question 7

Not answered

Marked out of 1.00

Use depth-first search to produce a spanning tree for the given simple graph. Choose **c** as the root of this spanning tree and assume that the vertices are ordered alphabetically.



Which edges will be removed?

- a. ac, eh
- b. cd, eh
- c. cd, fg
- d. None of these
- e. ac, eg

Your answer is incorrect.

The correct answer is:
cd, eh

Question 8

Not answered

Marked out of 1.00

Find the height of the expression tree for the infix expression

$$\left(\left(3 * x + y / 5\right) \uparrow 2\right) - \left(\left(x \uparrow 3 - y\right) / 4\right)$$

a. None of these

b. 5

c. 3

d. 4

e. 6

Your answer is incorrect.

The correct answer is:
4

Question 9

Not answered

Marked out of 1.00

Use Huffman coding to encode these symbols with given frequencies: a: 0.10, b: 0.13, c: 0.17, d: 0.20, e: 0.40.
What is the average number of bits required to encode a character?

- a. None of these
- b. 1.9
- c. 2.3
- d. 2.2
- e. 2.6

Your answer is incorrect.

The correct answer is:
2.2

Question 10

Not answered

Marked out of 1.00

Evaluate.

* + ↑ 2 3 / 6 2 - 8 ↑ 1 3

a. 0
b. 77
c. 66
d. 55
e. None of these

Your answer is incorrect.

The correct answer is:
77

Question **11**

Not answered

Marked out of 1.00

Use **Huffman coding algorithm** to encode the text "twitter".

What is the average number of bits required to encode a character?

- a. 7/4
- b. 11/5
- c. 7/5
- d. None of these
- e. 11/7

Your answer is incorrect.

The correct answer is:
None of these

Question 12

Not answered

Marked out of 1.00

Build a binary search tree for the words of the sentence

"The future belongs to those who believe in the beauty of their dreams"

How many comparisons required to locate the word "beauty"?

- a. 4
- b. 2
- c. None of these
- d. 3
- e. 5

Your answer is incorrect.

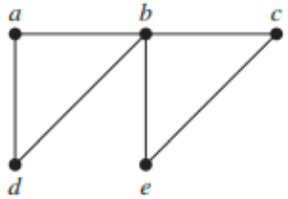
The correct answer is:
5

Question 13

Not answered

Marked out of 1.00

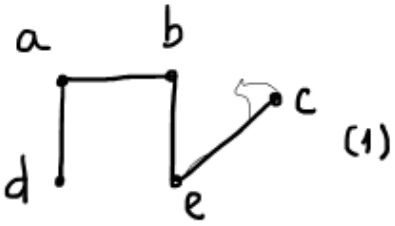
How many non-isomorphic **spanning trees** does this graph have?

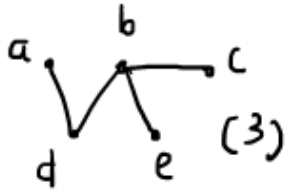


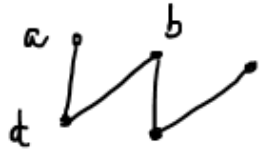
(Recall that a spanning tree in a graph G is a subgraph of G that is a tree containing every vertex of G)

- a. 4
- b. None of these
- c. 5
- d. 2
- e. 3

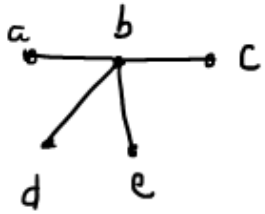
Your answer is incorrect.



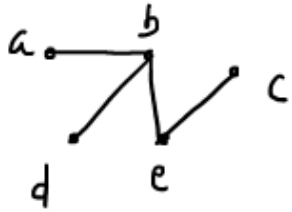




(1)



(2)



(3)

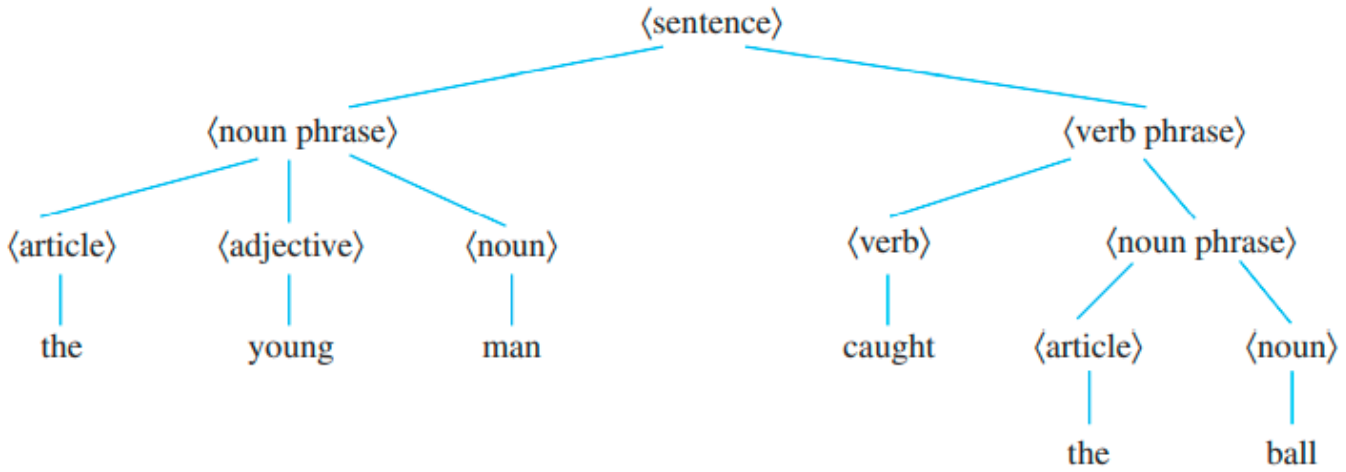
The correct answer is:
3

Question **14**

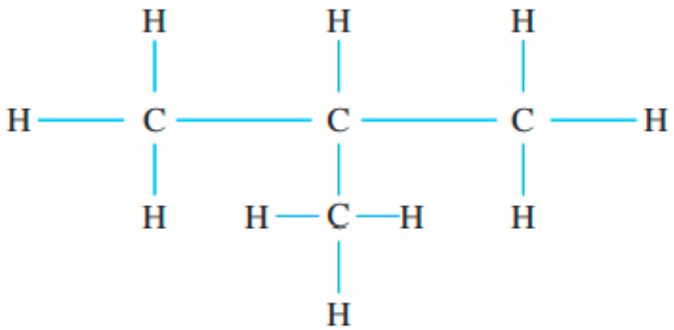
Not answered

Marked out of 1.00

Which graphs are NOT trees?



Graph G1



Graph G2

a. Neither
b. Graph G2
c. Both
d. Graph G1

Your answer is incorrect.

The correct answer is:
Neither

Question **15**

Not answered

Marked out of 1.00

A tree with n vertices is called **graceful** if its vertices can be labeled with the integers 1, 2,..., n such that the absolute values of the difference of the labels of adjacent vertices are all different.

Determine whether these graphs are **graceful**.

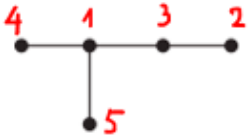
Graph G

Graph H

a. Graph G
b. Both
c. Neither
d. Graph H

Your answer is incorrect.

Graph G



Graph H

The correct answer is:
Both

Question **16**

Not answered

Marked out of 1.00

How many internal nodes does a full 4-ary tree with 34 leaves?

- a. 30
- b. 45
- c. None of these
- d. 10
- e. 11

Your answer is incorrect.

The correct answer is:
11

Question 17

Not answered

Marked out of 1.00

Use **Huffman coding algorithm** to encode the text "parabellum".
What is the average number of bits required to encode a character?

- a. None of these
- b. 3.5
- c. 2.5
- d. 2.7
- e. 2.8

Your answer is incorrect.

The correct answer is:
None of these

Question 18

Not answered

Marked out of 1.00

Build a binary search tree for the words peach, apple, durian, pear, coconut, mango, papaya using alphabetical order.

How many comparisons required to locate the word "papaya"?

- a. 2
- b. 4
- c. 5
- d. None of these
- e. 3

Your answer is incorrect.

The correct answer is:
5

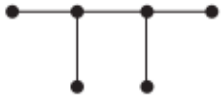
Question 19

Not answered

Marked out of 1.00

A **caterpillar** is a tree that contains a simple path such that every vertex not contained in this path is adjacent to a vertex in the path.

Which of these graphs are **caterpillars**?



Graph G

Graph H

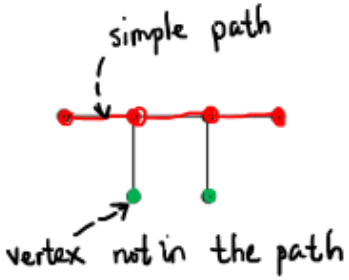
a. Graph H

b. Both

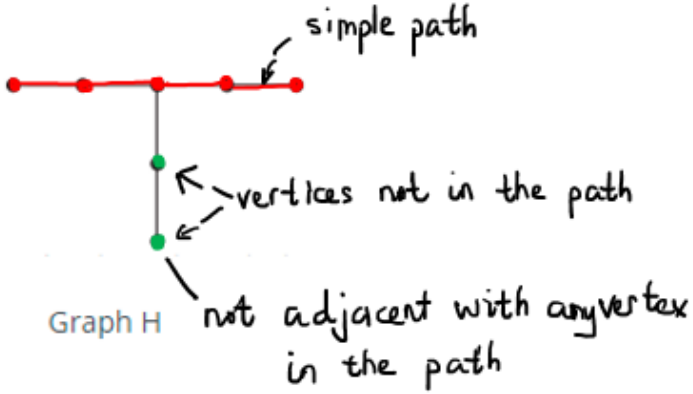
c. Graph G

d. Neither

Your answer is incorrect.



Graph G



Graph H

The correct answer is:
Graph G

Question 20

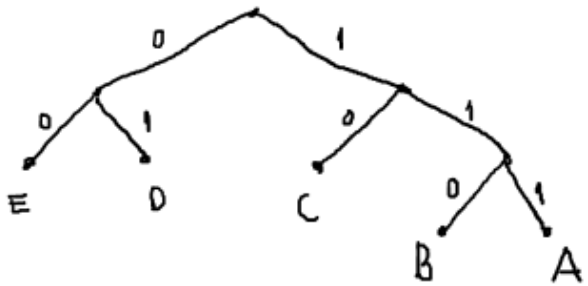
Not answered

Marked out of 1.00

Use **Huffman coding** to encode these symbols with given frequencies: A: 0.05, B: 0.10, C: 0.2, D: 0.30, E: 0.35.
What is the average number of bits required to encode a character?

- a. 2.33
- b. 2.11
- c. None of these
- d. 1.99
- e. 2.15

Your answer is incorrect.



Result = 0.05*3 + 0.10*3 + 0.2*2 + 0.3*2 + 0.35*2 = 2.15

The correct answer is:
2.15

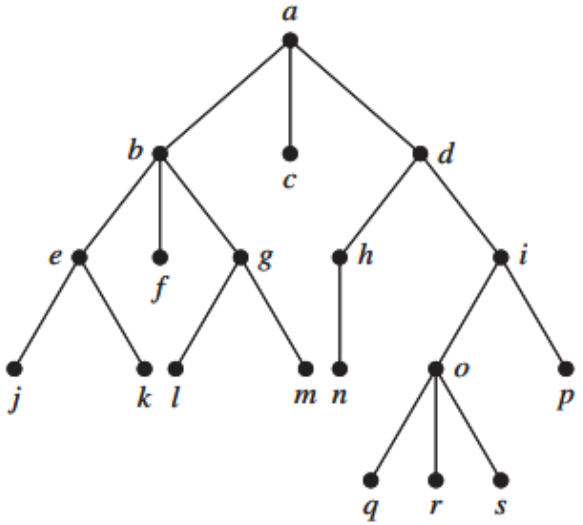
Question 21

Not answered

Marked out of 1.00

The **ancestors** of a vertex other than the root are the vertices in the path from the root to this vertex, excluding the vertex itself and including the root (that is, its parent, its parent's parent, and so on, until the root is reached).

How many **ancestors** of the vertex n?



- a. 3
- b. 2
- c. 5
- d. 4
- e. None of these

Your answer is incorrect.

The correct answer is:
3

Question 22

Not answered

Marked out of 1.00

Which of these codes are prefix codes?

(a) a: 10, e: 00, t: 110, s: 01
(b) a: 110, e: 001, t: 1110, s: 1001

- a. Both
- b. a)
- c. b)
- d. Neither

Your answer is incorrect.

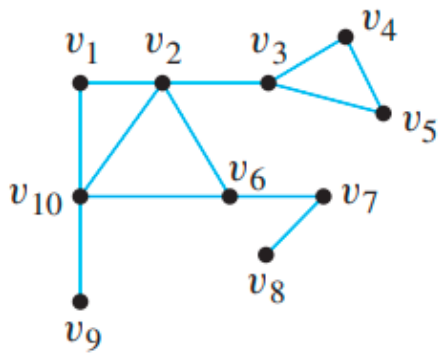
The correct answer is:
Both

Question 23

Not answered

Marked out of 1.00

How many **cut vertices** does the graph have?



a. 3

b. 1

c. 4

d. 5

e. 2

Your answer is incorrect.

Cut vertices: v10, v6, v7, v2, v3

The correct answers are: 5,
4,

3,

2,

1

Question 24

Not answered

Marked out of 1.00

Evaluate.

1 3 ↑ 6 2 / + 8 2 3 ↑ - *

a. -3

b. 0

c. None of these

d. -6

e. 3

Your answer is incorrect.

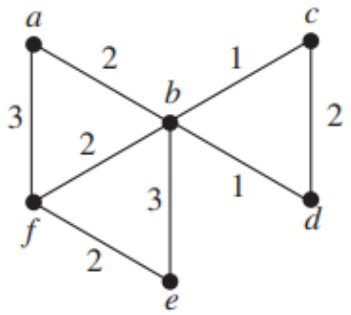
The correct answer is:
0

Question 25

Not answered

Marked out of 1.00

What is the total weight of the minimum spanning tree in this graph?



a. 9
b. None of these
c. 10
d. 8
e. 7

Your answer is incorrect.

The correct answer is:
8

Question 26

Not answered

Marked out of 1.00

Use **Huffman coding algorithm** to encode the text "havana".

What is the average number of bits required to encode a character?

- a. None of these
- b. 11/4
- c. 3/2
- d. 11/6
- e. 7/4

Your answer is incorrect.

The correct answer is:
11/6

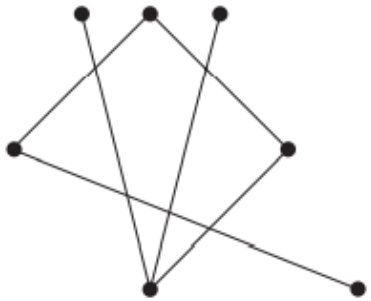
Question 27

Not answered

Marked out of 1.00

Which graphs are trees?

(i)



(ii)

a. (ii)

b. Both

c. (i)

d. Neither

Your answer is incorrect.

The correct answer is:
(i)

Question 28

Not answered

Marked out of 1.00

Which of these codes are prefix codes?

(a) a: 00, e: 010, t: 0110, s: 0111
(b) a: 11, e: 011, t: 101, s: 1101

- a. a)
- b. b)
- c. Both
- d. Neither

Your answer is incorrect.

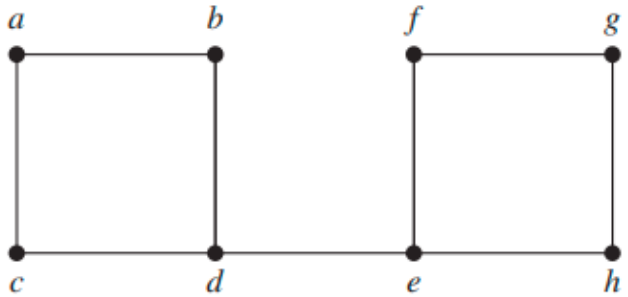
The correct answer is:
a)

Question 29

Not answered

Marked out of 1.00

Use breadth-first search to produce a spanning tree for the given simple graph. Choose d as the root of this spanning tree and assume that the vertices are ordered alphabetically.



Which edges will be removed?

- a. cd, fg
- b. ac, eh
- c. ac, eg
- d. None of these
- e. ac, hg

Your answer is incorrect.

The correct answer is:
ac, hg

Question 30

Not answered

Marked out of 1.00

What is the height of highest full binary tree with 15 nodes?

- a. 7
- b. None of these
- c. 6
- d. 14
- e. 8

Your answer is incorrect.

The correct answer is:
7