Question 1

Incorrect

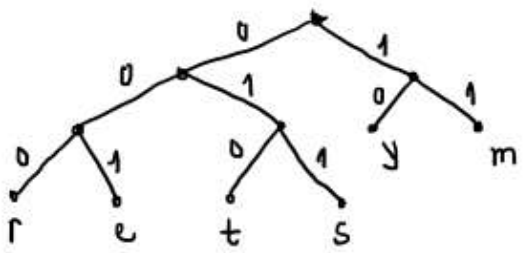
Mark 0.00 out of 1.00

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

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

- a. None of these ✖
- b. 2.8
- c. 2.6
- d. 2.7
- e. 2.5

Your answer is incorrect.



The text symmetry uses 20 bits
==> average number of bits: 20/8 = 2.5

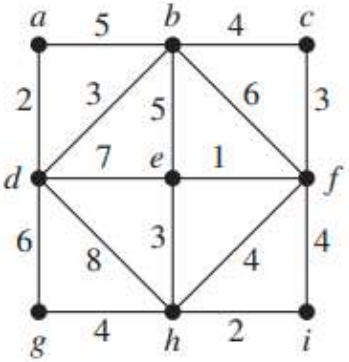
The correct answer is:
2.5

Question 2

Incorrect

Mark 0.00 out of 1.00

Use Prim's algorithm to find the minimum spanning tree for the following weighted graph.



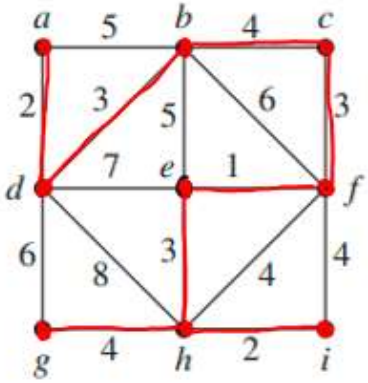
What is the total weight of the minimum spanning tree for this graph?

- a. 22
- b. 23
- c. 24
- d. None of these
- e. 20

Your answer is incorrect.

n = 9 vertices

==> Choose 8 edges



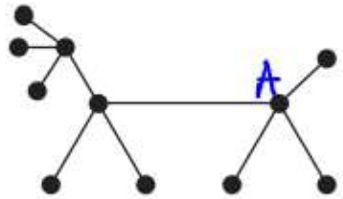
choice	edge	weight
1	{e, f}	1
2	{f, c}	3
3	{e, h}	3
4	{h, i}	2
5	{h, g}	4
6	{c, b}	4
7	{b, d}	3
8	{d, a}	2
	Total =	22

The correct answer is:
22

Question **3**

Incorrect

Mark 0.00 out of 1.00

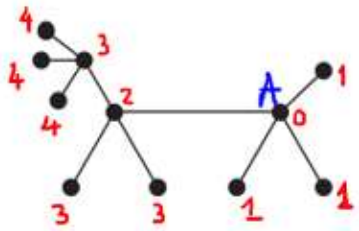


If A is the **root**, what is the **height** of this tree?

- a. 1
- b. 5
- c. 4
- d. 3
- e. 2

✖

Your answer is incorrect.



The correct answer is:
4

Question **4**

Incorrect

Mark 0.00 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.

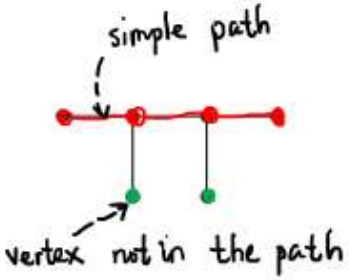
Which of these graphs are **caterpillars**?

Graph G

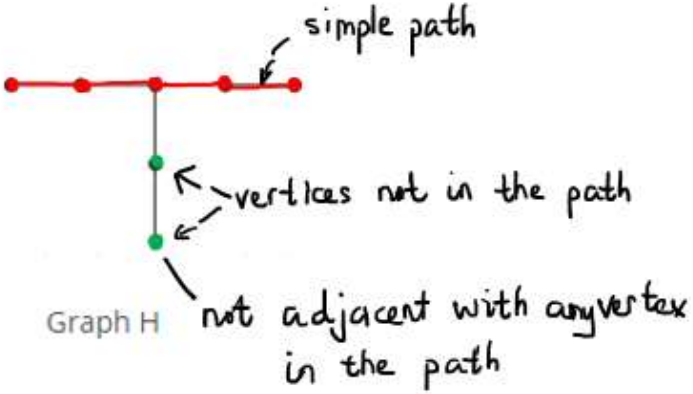
Graph H

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

Your answer is incorrect.



Graph G



Graph H

The correct answer is:
Graph G

Question **5**

Incorrect

Mark 0.00 out of 1.00

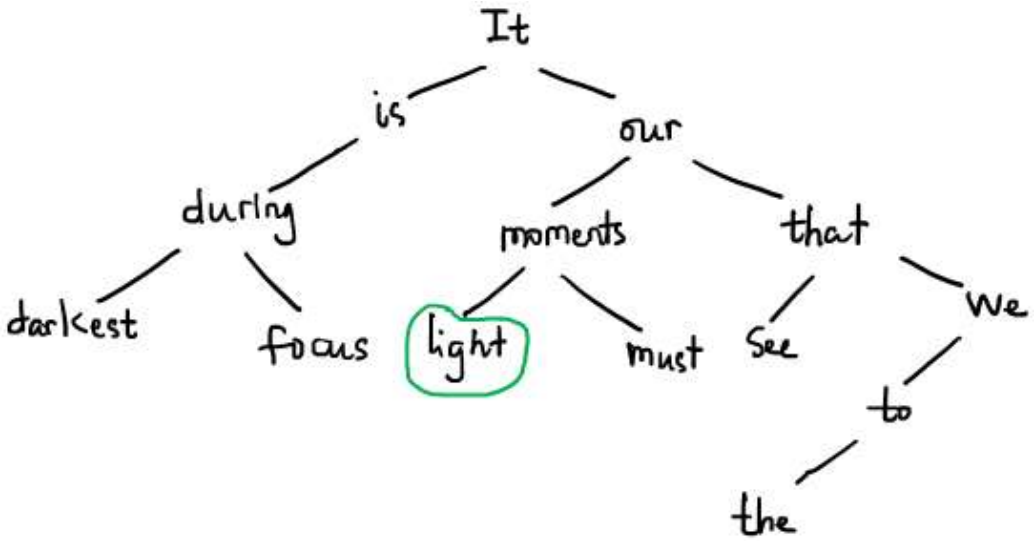
Use alphabetical order, construct a **binary search tree** for the words of the *Aristotle's* quote

"It is during our darkest moments that we must focus to see the light".

How many comparisons needed to locate the word "light" in the search tree?

- a. None of these
- b. 3
- c. 5
- d. 4
- e. 6 ✖

Your answer is incorrect.



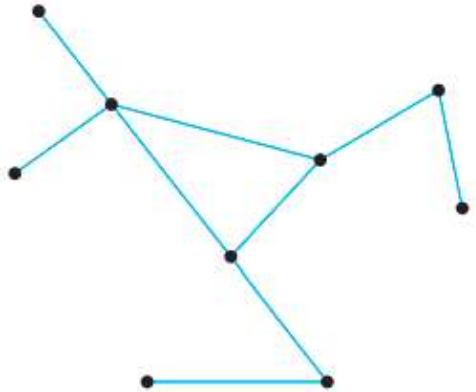
The correct answer is:
4

Question **6**

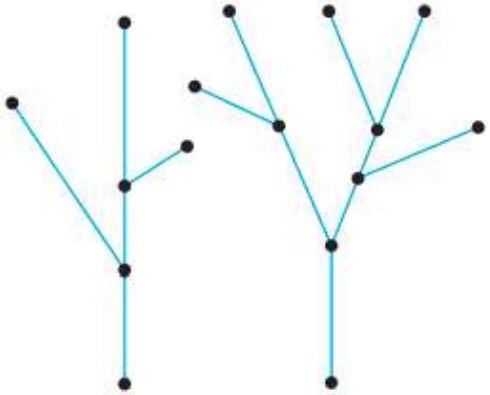
Incorrect

Mark 0.00 out of 1.00

Which graphs are trees?



Graph G



Graph H

a. Graph G

b. Neither

c. Both

d. Graph H

Your answer is incorrect.

Graph G: has a simple circuit

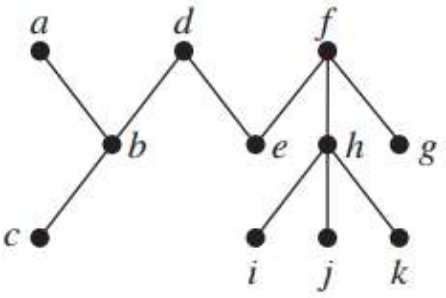
Graph H: disconnected

The correct answer is:
Neither

Question **7**

Correct

Mark 1.00 out of 1.00

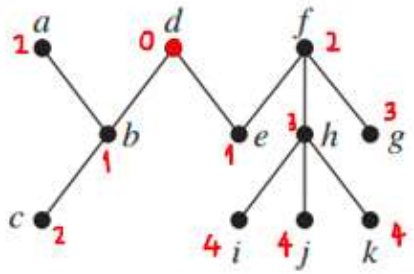


If the vertex **d** is the **root**, what is the **height** of this tree?

- a. 3
- b. 4
- c. 1
- d. 5
- e. 2

Your answer is correct.

Levels of nodes:



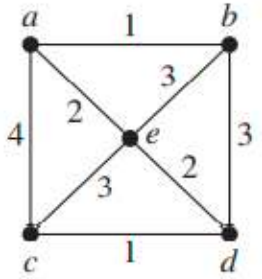
The correct answer is:
4

Question **8**

Correct

Mark 1.00 out of 1.00

Use Prim's algorithm to find the minimum spanning tree for the following weighted graph.



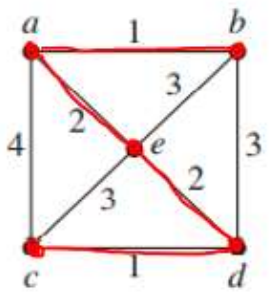
What is the total weight of the minimum spanning tree for this graph?

- a. 5
- b. None of these
- c. 8
- d. 7
- e. 6 ✔

Your answer is correct.

n = 5 vertices

==> Choose 4 edges



choice	edge	weight
1	{a, b}	1
2	{a, e}	2
3	{e, d}	2
4	{d, c}	1
		total = 6

The correct answer is:
6

Question **9**

Correct

Mark 1.00 out of 1.00

How many **internal vertices** does a full ternary tree with 34 vertices have?

- a. 33
- b. 23
- c. 17
- d. 11 ✔
- e. 16

Your answer is correct.

full ternary ==> m = 3

n = 34

n = i + l = 34

n = mi + 1 = 3i + 1 = 34

==> i = 11, l = 23

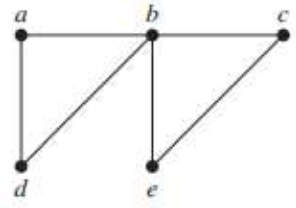
The correct answer is:
11

Question **10**

Incorrect

Mark 0.00 out of 1.00

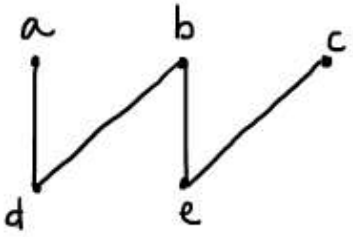
How many non-isomorphic **spanning trees** does this graph have?



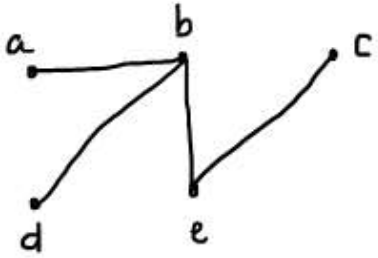
(Recall that a spanning tree in a graph G is a subgraph of G that is a tree containing every vertex of G)

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

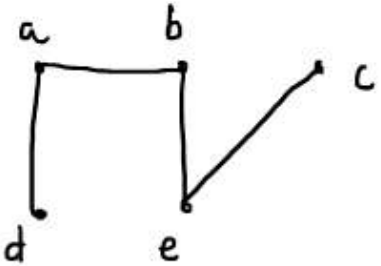
Your answer is incorrect.



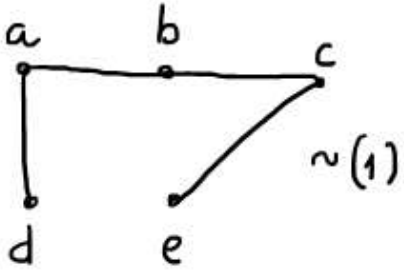
(1)



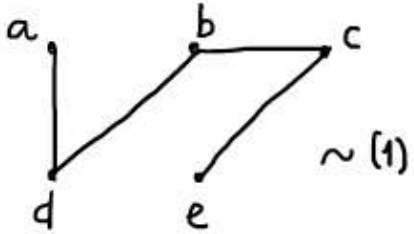
(2)



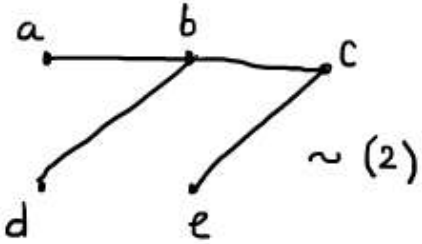
~ (1)



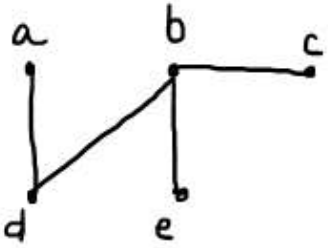
~ (1)



~ (1)



~ (2)



~ (2)

The correct answer is:
3