### Question 1

What is the height of spanning tree obtained from Wn by the breadth-first search, starting at the central vertex of Wn?

Select one:

a. n-1

b. n

c. None of the other choices is correct

d. 1

### Question 2

What is the total weight of the minimum spanning tree produced by the graph below:



Select one:

a. None of the other choices is correct

b. 14

c. 19

d. 16

e. 15

### Question 3

Let T be a tree with 1000 vertices. Deleting a vertex and all of its incident edges we obtain 3 trees T1, T2, T3. Assume that the number of edges of T1, T2, T3 form an arithmetic progression with difference 3. Find the number of edges of T3.

### Question 4

How many leaves are there in a decision tree representing the sorting of a list of 5 elements? 5!=120

### Question 5

Find the value of the prefix expression:

+ - \* 4 3 5 2

+ - 12 5 2

+ 7 2

9

### Question 6

Count the number of leaves in this tree.



### Question 7

Given a message 15 letters A, 17 letters B, 18 letters C, 20 letters D, 30 letters E. Find the length of the bit string when encoding this message by a Huffman coding.

### Question 8

  
  
What is the position of the letter D when using preorder traversal?

### Question 9

Find the inverse Polish notation (postfix) for the expression

((x + y) ↑ 2) \* (y - 3 ∕ x) + 4 (Infix)

Select one:

a. x y + 2 y ↑ 3 x ∕ − \* 4 +

b. x y + 2 ↑ y 3 x ∕ − \* 4 +

c. x y + 2 ↑ y 3 ∕ x− \* 4 +

d. x + y 2 ↑ y 3 x ∕ − \* 4 +

### Question 10

Find the length of the bit string when encoding the message abbcccdddd by a Huffman coding.

### Question 11

Find the value of the prefix expression

\* + 4 + 4 ↑ 2 8 2

### Question 12

Let T be a full 4-ary tree in which all leaves are at level 3. Find the number of vertices of T.

l=4^3

n=(m.l-1)/(m-1)=(4.4^3-1)/3=85

i=(l-1)/(m-1)=(4^3-1)/3=21

### Question 13

Draw a binary search tree for the sentence  
  
"mot long tho me kinh cha".  
  
Then find the number of comparisons needed to locate the word "cha".

### Question 14

Find the value of the prefix expression

\* + 3+ 3 \* 3 ↑3 – 3 3 3

27

### Question 15

Find the value of the postfix expression

2 6 + 3 \* 4 2 - 7 2 \* - /

24 -12 /

-2

### Question 16

Determine a Huffman coding for the characters

A: 0.45, B: 0.25, C: 0.2, D: 0.1

Select one:

a. A := 0 B:= 1 C:= 10 D:= 11

b. A := 0 B:= 11 C:= 110 D:= 111

c. A := 1 B:= 01 C:= 000 D:= 001

d. A := 0 B:= 11 C:= 01 D:= 00

### Question 17

Find the value of the postfix expression

2 6 + 7 \* 4 2 + 7 2 \* - /

-7

### Question 18

Let T be a tree with 1000 vertices. Deleting a vertex and all of its incident edges we obtain 3 trees T1, T2, T3. Assume that the number of edges of T1, T2, T3 form an arithmetic progression with difference 3. Find the number of edges of T1.

### Question 19

How many leaves are there in a decision tree representing the sorting of a list of 4 elements?

### Question 20

  
  
What is the position of the letter D when using preorder traversal? K,B,C,G,E,F,**D**,.H.I.A

What is the position of the letter D when using in-order traversal? C,B,G,,K,E,H,**D**,I,F,A

What is the position of the letter D when using postorder traversal? C,G,B,E,H,I,**D**,A,F,K

Question 21: Use Huffman coding to encode these symbols with given frequencies

A: 0.35 B: 0.2 C: 0.25 D: 0.15 E: 0.05

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

Question 22: Give the coding scheme

A: 001, B: 1011, C: 11, D: 0000, E: 0100, F: 011, G: 101001.

Find a and b such that we have a prefix code.

a)

b)

Question 23:

|  |
| --- |
| Find the postorder traversal of the tree (trái, phải,gốc) |
| 1. a - c - f - g - e - b - i - j - k - n - m - o - p - l - h - d |
| 1. d - b - a - c - e - f - g - h - i - l - j - m - k - n - o - p |
| 1. a - b - c - f - e - g - d - i - h - j - l - k - m - n - o - p |
| 1. None of the other choices is correct |

PREOEDER: d,b,a,c,e,f,g,h,I,l,j,m,k,n,o,p

In-order: a,b,c,f,e,g,d,I,h,,j,l,k,m,n,o,p

Question 24:

|  |
| --- |
| How many edges must be removed from the graph to get a spanning tree? |
| 1. 1 |
| 1. 2 |
| 1. 3 |
| 1. 4 |
| 1. None of the other choices is correct. |
| Câu 25: How many non-isomorphic trees of 4 vertices? |
| 1. 4 |
| 1. None of the other choices is correct |
| 1. 3 |
| 1. 2 |
| 1. 1 |
| Câu 26: How many edges in a full 3-ary tree with 101 leaves? |
| 1. 102 |
| 1. 150 |
| 1. None of the other choices is correct |
| 1. 101 |
| 1. 97 |

N=3.101-1/2=151 => số cạnh=150