$N = 9\times(6-1)+1$

$= 9\times 5+1 = 46$

Question No: 31 (Marks: 2)
Let A and B be the events. Rewrite the following event using set notation
"A or not B occurs"

Question No: 32 (Marks: 2)
Find a non-isomorphic tree with four vertices.
Solution: Page 323

Any tree with four vertices has (4-1=3) three edges. Thus, the total degree of a tree with 4 vertices must be 6 [by using total degree=2(total number of edges)].

Also, every tree with more than one vertex has at least two vertices of degree 1, so the only possible combinations of degrees for the vertices of the trees are 1, 1, 1, 3 and 1, 1, 2, 2.
The corresponding trees (clearly non-isomorphic, by definition) are

Question No: 33 (Marks: 2)
Write the following in the factorial form:
n(n -1)(n-2)…(n-r+1)
Solution Page 217:

$$n(n-1)(n-2)\ldots(n-r+1) = \frac{n(n-1)(n-2)\ldots(n-r+1)-(n-r)!}{(n-r)!}$$

$$= \frac{n!}{(n-r)!}$$

Question No: 34 (Marks: 3)
Compute ëxû and éxù for $x = 25/4$

Question No: 35 (Marks: 3)
Find a spanning tree for the graph $k_{1,5}$?

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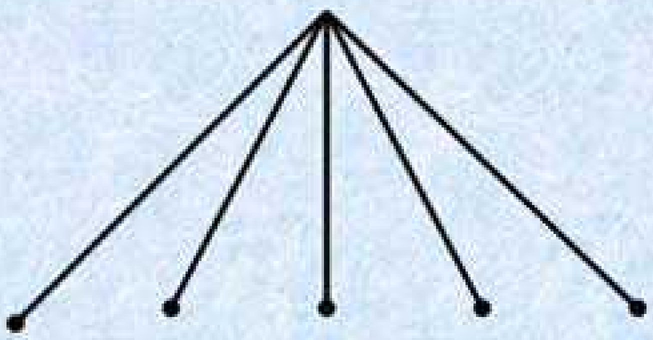
$k_{1,5}$ represents a complete bipartite graph on (1,5) vertices, drawn below:

Solution (Page 332):



Clearly the graph itself is a tree (six vertices and five edges). Hence the graph is itself a spanning tree.

Question No: 36 (Marks: 3)
The members of a club are 12 boys and 8 girls. In how many ways can a committee of 3 boys and 2 girls be formed?

Solution:
$C(12,3)\times C(8,2) = 220\times 28 = 6160$

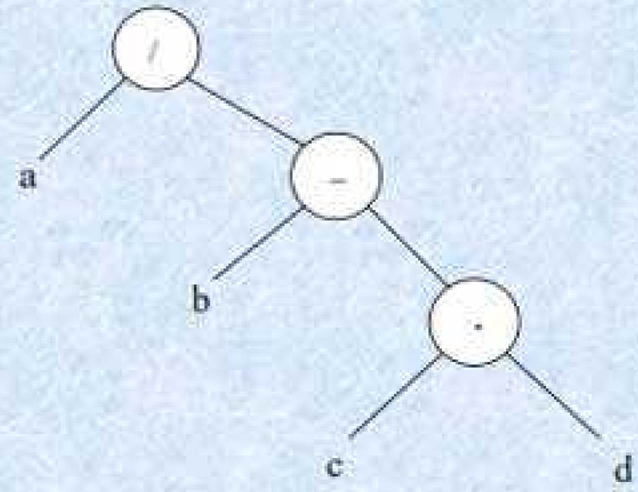
Question No: 37 (Marks: 5)
Is it possible to have a simple graph with four vertices of degree 1, 1, 3, and 3.If no then give reason?(Justify your answer)
Solution:

Yes, It is possible to make a graph with four vertices of degree 1, 1, 3, 3
Because 1+1+3+3=8
And According to handshaking theorem, the sum of the degrees of all the vertices of G equals twice the number of edges of G.
2*4=8
So it is possible.

Question No: 38 (Marks: 5)
Draw a binary tree to represent the following expression
a/(b-c.d)

The internal vertices are arithmetic operators, the terminal vertices are variables and the operator at each vertex acts on its left and right sub trees in left-right order.

Solution:



Question No: 39 (Marks: 5)
There are 25 people who work in an office together. Four of these people are selected to attend four different conferences. The first person selected will go to a conference in New York, the second will go to Chicago, the third to San Francisco, and the fourth to Miami. How many such selections are possible?

Question No: 31 (Marks: 2)
Let A and B be the events. Rewrite the following event using set notation
"Only A occurs"
AB^c

Question No: 32 (Marks: 2)
Suppose that a connected planar simple graph has 15 edges. If a plane drawing of this graph has 7 faces, how many vertices does this graph have?

Answer:

Given,
Edges = v =15
Faces = f = 7

Vertices = v =?
According toEuler Formula, we know that,

f= e – v +2

Putting values, we get

7 = 15 – v + 2

7 = 17 – v

Simplifying

v =1 7-7 =10

Question No: 33 (Marks: 2)
How many ordered selections of two elements can be made from the set {0,1,2,3}?

Answer:

The order selection of two elements from 4 is as

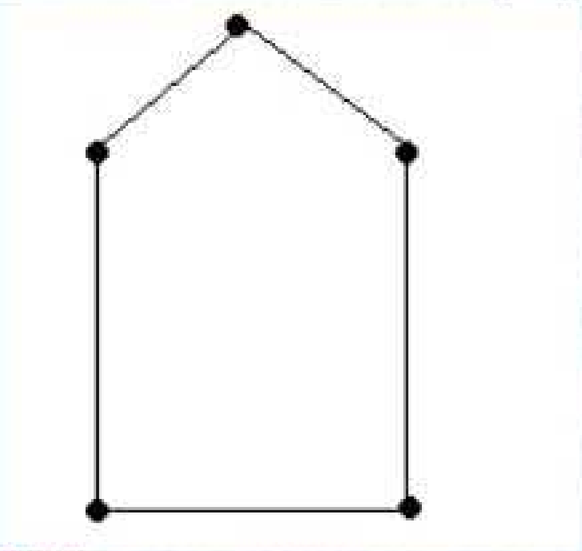
P (4, 2) = 4! / (4-2)!

= (4.3.2.1)/2!

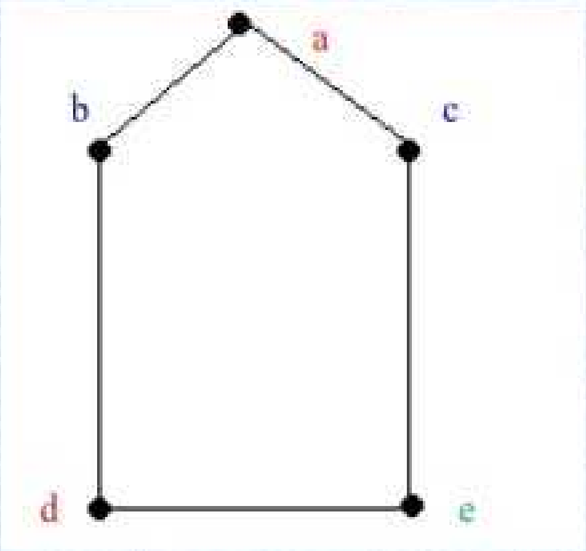
= 12

Question No: 34 (Marks: 3)
Consider the following events for a family with children:
A={children of both sexes}, B={at most one boy}.Show that A and B are dependent events if a family has only two children.

Question No: 35 (Marks: 3)
Determine the chromatic number of the given graph by inspection.



Solution:



The **chromatic number** of a graph is the least (minimum) number of colors for coloring of this graph.
So chromatic number in this graph is 3

Question No: 36 (Marks: 3)
A cafeteria offers a choice of two soups, five sandwiches, three desserts and three drinks. How many different lunches, each consisting of a soup, a sandwich, a dessert and a drink are possible?

Solution:

$$C(13,4)=\frac{13!}{4!\times(13-4)!}$$

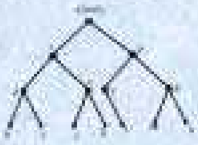
$$=\frac{13\times12\times11\times10\times 9!}{4!\times 9!}=\frac{17160}{24}=715$$

Question No: 37 (Marks: 5)
A box contains 15 items, 4 of which are defective and 11 are good. Two items are selected. What is probability that the first is good and the second defective?

Question No: 38 (Marks: 5)
Draw a binary tree with height 3 and having seven terminal vertices.

Solution: On Page 327

Given height=h=3
Any binary tree with height 3 has atmost 2^3=8 terminal vertices.
But here terminal vertices are 7
and Internal vertices=k=6 so binary tree exists and is as follows:



Question No: 39 (Marks: 5)
Find n if
P(n.2) = 72
Solution:

$P(n,2) = 72$

$n(n-1) = 72$ by using the definition of permutation

$n^2 - n = 72$

$n^2 - n - 72 = 0$

$n^2 + 8n - 9n - 72 = 0$

$n(n+8) - 9(n+8) = 0$

$(n-9)(n+8) = 0$

$n - 9 = 0 \qquad n + 8 = 0$

$n = 9 \qquad n = -8$

n = 9 or -8

since n must be positive so only the acceptable value for n is 9