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DTU/2K16/MC/13

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Graph Theory - Quiz - 2

Q1) $2n - 1$

$3n - 2$

$n - 3$

$|V| = |E| + 1$ is true

We also know $\sum \deg(G_n) = 2|E|$

$$E = \frac{1}{2}\sum \deg(G)$$

$$2n + 3n + n = \frac{1}{2}(2n \cdot 1 + 3n \cdot 2 + 3n) + 1$$

$$6n = \frac{1}{2}(2n + 6n + 3n) + 1$$

$$6n = \frac{11n}{2} + 1$$

$$6n - \frac{11n}{2} = 1$$

$$\frac{n}{2} = 1$$

$$\boxed{n = 2}$$

~~$2n / |E|$ Ext~~

$|V| = 6n = 12$

$|E| = |V| - 1 = 11$

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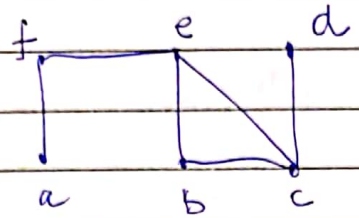
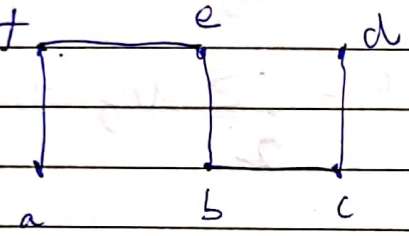
Q2] Number of spanning trees :-

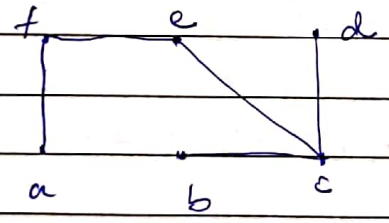


The spanning trees are :-

i)

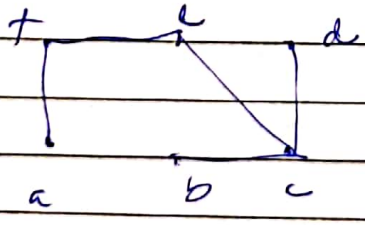


ii)



There are 2 spanning trees.

iii)



So, there are 3 spanning trees

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Q3)

T_1 T_2

The following trees are non-isomorphic with exactly 4 pendent and 6 vertices.

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Q4) ~~$|V(T_1)| < |V(T_2)|$~~

$|V(T_1)| = |E(T_2)|$

$|V(T_1)| = ?$

$|V(T_2)| = ?$

$|V(T)| = |V(T_1)| + |V(T_2)|$

$|E(T)| = |E(T_1)| + |E(T_2)| + 1$

$|E(T)| = 50$

$|E(T)| = |V(T_1)| - 1 + |V(T_2)| - 1 + 1$

$|E(T)| = |V(T_1)| + |E(T_2)|$

$= 2|V(T_1)|$

$$|V(T_1)| = |E(T_2)| = \frac{25}{2}$$

$$E(T_1) = V(T_1) - 1 = 24$$

$$|E(T_2)| = |V(T_1)| = 25$$

$$|V(T_2)| = |E(T_2)| + 1 = 26$$