Important Circuit Graph Theory Formulas PDF

Formulas
Examples
with Units

List of 15
Important Circuit Graph Theory Formulas

1) Average Degree Formula

Evaluate Formula

Formula

$$k = p \cdot N$$

Example

$$4.5 = 0.75 \cdot 6$$

2) Average Path Length between Connected Nodes Formula

Evaluate Formula

Formula

$$L_{Path} = \frac{\ln(N)}{\ln(k)}$$

Example

$$1.1913 = \frac{\ln(6)}{\ln(4.5)}$$

3) Maximum Number of Edges in Bipartite Graph Formula

Evaluate Formula

Formula

$$b_b = \frac{N^2}{4}$$

Example

$$9 = \frac{6^2}{4}$$

4) Number of Branches in any Graph Formula

Evaluate Formula

Formula

$$b = L + N - 1$$

Example

$$8 = 3 + 6 - 1$$

5) Number of Branches in Complete Graph Formula

Evaluate Formula

Formula

$$b_c = \frac{N \cdot (N - 1)}{2}$$

Example

$$15 = \frac{6 \cdot (6 - 1)}{2}$$

6) Number of Branches in Forest Graph Formula

Evaluate Formula

Formula

$$b_f = N - N_{comp}$$

Example

$$4 = 6 - 2$$

7) Number of Branches in Wheel Graph Formula

Evaluate Formula

Formula

$$b_w = 2 \cdot (N - 1)$$

Example

$$10 = 2 \cdot (6 - 1)$$

8) Number of Graphs given Nodes Formula

Evaluate Formula

Formula

$$N_{graph} = 2^{N \cdot \frac{N-1}{2}}$$

Example

$$32768 = 2^{6 \cdot \frac{6-1}{2}}$$

9) Number of Links in any Graph Formula

Evaluate Formula

Formula

$$L = b - N + 1$$

Example

$$3 = 8 - 6 + 1$$

10) Number of Maxterms and Minterms Formula

Evaluate Formula

Formula

$$N_{\tau} = 2^{n}$$

Example

$$2048 = 2^{11}$$

11) Number of Nodes in any Graph Formula

Evaluate Formula

Formula

$$N = b - L + 1$$

Example

$$6 = 8 - 3 + 1$$

12) Rank for Incidence Matrix using Probability Formula

Evaluate Formula

Formula

$$\rho = N - p$$

Example

$$5 = 6 - 0.75$$

13) Rank of Cutset Matrix Formula

Evaluate Formula

Formula

$$\rho = N - 1$$

Example

$$5 = 6 - 1$$

14) Rank of Incidence Matrix Formula

Evaluate Formula

Formula

$$\rho = N - 1$$

Example

$$5 = 6 - 1$$

15) Spanning Tress in Complete Graph Formula

Evaluate Formula

Formula

$$N_{span} = N^{N-2}$$

Example

$$1296 = 6^{6-2}$$

Variables used in list of Circuit Graph Theory Formulas above

- **b** Simple Graph Branches
- b_b Bipartite Graph Branches
- b_c Complete Graph Branches
- b_f Forest Graph Branches
- b_w Wheel Graph Branches
- **k** Average Degree
- **L** Simple Graph Links
- L_{Path} Average Path Length
- **n** Number of Input Variables
- **N** Nodes
- N_{comp} Forest Graph Components
- N_{graph} Number of Graph
- N_{span} Spanning Trees
- N_T Total Minterms/ Maxterms
- **p** Node Connection Probability
- **ρ** Matrix Rank

Constants, Functions, Measurements used in list of Circuit Graph Theory Formulas above

- Functions: **ln**, ln(Number)
  The natural logarithm, also known as the logarithm to the base e, is the inverse function of the natural exponential function.

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