Important Telecommunication Traffic System Formulas PDF

Formulas
Examples
with Units

List of 22
Important Telecommunication Traffic System Formulas

1) Availability Formula

Evaluate Formula

Formula

$$A = \frac{u}{u + d}$$

Example with Units

$$0.7 = \frac{15.98\,s}{15.98\,s + 6.85\,s}$$

2) Average Holding Time Formula

Evaluate Formula

Formula

$$AHT = \frac{A_{avg} \cdot T}{n}$$

Example with Units

$$1.67\,s = \frac{2.5 \cdot 30\,s}{44.91}$$

3) Average Number of Call Formula

Evaluate Formula

Formula

$$n = \frac{A_{avg} \cdot T}{AHT}$$

Example with Units

$$44.9102 = \frac{2.5 \cdot 30\,s}{1.67\,s}$$

4) Average Occupancy Formula

Evaluate Formula

Formula

$$A_{avg} = \frac{n \cdot AHT}{T}$$

Example with Units

$$2.5 = \frac{44.91 \cdot 1.67\,s}{30\,s}$$

5) Average Poisson Call Arrival Rate Formula

Evaluate Formula

Formula

$$\lambda = \frac{A_p}{T}$$

Example with Units

$$3.8133 = \frac{114.4}{30\,s}$$

6) Call Setup Time Formula

Evaluate Formula

Formula

$$T_{cs} = T_{other} + K \cdot T_{st}$$

Example with Units

$$0.353\,s = 0.11\,s + 3 \cdot 0.081\,s$$

7) Cost Capacity Index Formula

Evaluate Formula

Formula

$$C_{ci} = \frac{N \cdot SC}{C}$$

Example

$$30.3689 = \frac{15 \cdot 33.75}{16.67}$$

8) Cost of Common Hardware Formula

Evaluate Formula

Formula

$$C_{ch} = C_{sw} - \left(n_{sw} \cdot C_s \right) - C_c$$

Example

$$26.05 = 29 - \left(0.25 \cdot 2 \right) - 2.45$$

9) Cost of Switching System Formula

Evaluate Formula

Formula

$$C_{sw} = n_{sw} \cdot C_s + C_{ch} + C_c$$

Example

$$29 = 0.25 \cdot 2 + 26.05 + 2.45$$

10) Cost per Subscriber Formula

Evaluate Formula

Formula

$$C = \frac{N \cdot SC}{C_{ci}}$$

Example

$$16.6749 = \frac{15 \cdot 33.75}{30.36}$$

11) Downtime Formula

Evaluate Formula

Formula

$$d = \frac{u - A \cdot u}{A}$$

Example with Units

$$6.8486\,\text{s} = \frac{15.98\,\text{s} - 0.70 \cdot 15.98\,\text{s}}{0.70}$$

12) Grade of Service Formula

Evaluate Formula

Formula

$$GoS = \frac{N_L}{T_c}$$

Example

$$0.27 = \frac{6.985}{25.87}$$

13) Number of Lost Call Formula

Evaluate Formula

Formula

$$N_L = T_c \cdot GoS$$

Example

$$6.9849 = 25.87 \cdot 0.27$$

14) Poisson Arrival Formula

Evaluate Formula

Formula

$$A_p = \lambda \cdot T$$

Example with Units

$$114.3 = 3.81 \cdot 30\,\text{s}$$

15) Quantization Error Formula

Evaluate Formula

Formula

$$e_q = \frac{V_{sin}}{2 \cdot V}$$

Example with Units

$$0.012 = \frac{2.88}{2 \cdot 120\,\text{V}}$$

16) Switching Capacity Formula

Evaluate Formula

Formula

$$SC = \frac{N \cdot TC}{2}$$

Example

$$33.75 = \frac{15 \cdot 4.5}{2}$$

17) Time Required for Functions other than Switching Formula

Evaluate Formula

Formula

$$T_{other} = T_{cs} - K \cdot T_{st}$$

Example with Units

$$0.11\,\text{s} = 0.353\,\text{s} - 3 \cdot 0.081\,\text{s}$$

18) Total Number of Offered Calls Formula

Evaluate Formula

Formula

$$T_c = \frac{N_L}{GoS}$$

Example

$$25.8704 = \frac{6.985}{0.27}$$

19) Traffic Handling Capability Formula

Evaluate Formula

Formula

$$TC = \frac{2 \cdot SC}{N}$$

Example

$$4.5 = \frac{2 \cdot 33.75}{15}$$

20) Trunk Occupancy Formula

Evaluate Formula

Formula

$$\rho = A_o \cdot \frac{1 - GoS}{A_{avg}}$$

Example

$$0.2482 = 0.85 \cdot \frac{1 - 0.27}{2.5}$$

21) Unavailability of System Formula

Evaluate Formula

Formula

$$U = 1 - A$$

Example

$$0.3 = 1 - 0.70$$

22) Uptime Formula

Evaluate Formula

Formula

$$u = \frac{A \cdot d}{1 - A}$$

Example with Units

$$15.9833\,\text{s} = \frac{0.70 \cdot 6.85\,\text{s}}{1 - 0.70}$$

Variables used in list of Telecommunication Traffic System Formulas above

- **A** Availability
- A_{avg} Average Occupancy
- A_o Occupancy
- A_p Poisson Arrival
- **AHT** Average Holding Time *(Second)*
- **C** Cost per Subscriber
- C_c Cost of Common Control System
- C_{ch} Cost of Common Hardware
- C_{ci} Cost Capacity Index
- C_s Cost per Switching Element
- C_{sw} Cost of Switching System
- **d** Downtime *(Second)*
- e_q Quantization Error
- **GoS** Grade of Service
- **K** Number of Switching Stage
- **n** Average Number of Calls
- **N** Number of Subscriber Lines
- N_L Number of Lost Calls
- n_{sw} Number of Switching Element
- **SC** Switching Capacity
- **T** Time Period *(Second)*
- T_c Total Number of Offered Calls
- T_{cs} Call Setup Time *(Second)*
- T_{other} Time Required Other than Switching *(Second)*
- T_{st} Average Switching Time per Stage *(Second)*
- **TC** Traffic Handling Capacity
- **u** Uptime *(Second)*
- **U** Unavailability
- **V** Voltage *(Volt)*
- V_{sin} Sinusoidal Input
- **λ** Average Poisson Call Arrival Rate

Constants, Functions, Measurements used in list of Telecommunication Traffic System Formulas above

- Measurement: **Time** in Second (s)
  Time Unit Conversion
- Measurement: **Electric Potential** in Volt (V)
  Electric Potential Unit Conversion

- ρ Trunk Occupancy

Download other Important Telecommunication Switching Systems PDFs

- Important Digital Switching System Formulas
- Important Telecommunication Traffic System Formulas

Try our Unique Visual Calculators

- Percentage error
- LCM of three numbers
- Subtract fraction

Please SHARE this PDF with someone who needs it!

This PDF can be downloaded in these languages

English Spanish French German Russian Italian Portuguese Polish Dutch

7/9/2024 | 3:47:28 AM UTC