Important Industrial Parameters Formulas PDF

Formulas
Examples
with Units

List of 12
Important Industrial Parameters Formulas

1) Annual Devaluation Rate Formula

Evaluate Formula

Formula

$$f_c = \frac{i_{fc} - i_{u.s}}{1 + i_{u.s}}$$

Example

$$0.1875 = \frac{18 - 15}{1 + 15}$$

2) Binomial Distribution Formula

Evaluate Formula

Formula

$$P_{binomial} = n_{trials}! \cdot p^{x} \cdot \frac{q^{n_{trials} - x}}{x! \cdot \left(n_{trials} - x\right)!}$$

Example

$$0.1935 = 7! \cdot 0.6^{3} \cdot \frac{0.4^{7 - 3}}{3! \cdot \left(7 - 3\right)!}$$

3) Crashing Formula

Evaluate Formula

Formula

$$CS = \frac{CC - NC}{NT - CT}$$

Example with Units

$$55 = \frac{1400 - 300}{129620\,s - 129600\,s}$$

4) Forecasting Error Formula

Evaluate Formula

Formula

$$e_t = D_t - F_t$$

Example

$$5 = 45 - 40$$

5) General Sewing Data Formula

Evaluate Formula

Formula

$$GSD = \frac{M \cdot W_T}{T}$$

Example with Units

$$2.6667 = \frac{50 \cdot 28800\,s}{150}$$

6) Learning Factor Formula

Evaluate Formula

Formula

$$k = \frac{\log 10(a_1) - \log 10(a_n)}{\log 10}(n_{tasks})$$

Example with Units

$$0.4582 = \frac{\log 10(3600\,\mathrm{s}) - \log 10(1200\,\mathrm{s})}{\log 10}(11)$$

7) Macroscopic Traffic Density Formula

Evaluate Formula

Formula

$$K_c = \frac{Q_i}{\frac{V_m}{0.277778}}$$

Example with Units

$$33.3334 = \frac{1000}{\frac{30\,\mathrm{km/h}}{0.277778}}$$

8) Normal Distribution Formula

Evaluate Formula

Formula

$$P_{normal} = \frac{e^{-\frac{(x-\mu)^2}{2 \cdot \sigma^2}}}{\sigma \cdot \sqrt{2 \cdot \pi}}$$

Example

$$0.0967 = \frac{e^{-\frac{(3-2)^2}{2 \cdot 4^2}}}{4 \cdot \sqrt{2 \cdot 3.1416}}$$

9) Poisson Distribution Formula

Evaluate Formula

Formula

$$P_{poisson} = \mu^x \cdot \frac{e^{-\mu}}{x!}$$

Example

$$0.1804 = 2^3 \cdot \frac{e^{-2}}{3!}$$

10) Reorder Point Formula

Evaluate Formula

Formula

$$RP = DL + S$$

Example

$$4435 = 1875 + 2560$$

11) Traffic Intensity Formula

Evaluate Formula

Formula

$$\rho = \frac{\lambda_a}{\mu}$$

Example

$$0.9 = \frac{1800}{2000}$$

12) Variance Formula

Evaluate Formula

Formula

$$\sigma^2 = \left(\frac{t_p - t_0}{6}\right)^2$$

Example with Units

$$40000 = \left(\frac{174000\,\mathrm{s} - 172800\,\mathrm{s}}{6}\right)^2$$

Variables used in list of Industrial Parameters Formulas above

- **μ** Mean Service Rate
- **a_1** Time for Task 1 *(Second)*
- **a_n** Time for n Tasks *(Second)*
- **CC** Crash Cost
- **CS** Cost Slope
- **CT** Crash Time *(Second)*
- **D_t** Observed Value at Time t
- **DL** Lead Time Demand
- **e_t** Forecasting Error
- **f_c** Annual Devaluation Rate
- **F_t** Smooth Averaged Forecast for Period t
- **GSD** GSD
- **i_{fc}** Rate of Return Foreign Currency
- **$i_{u.s}$** Rate of Return USD
- **k** Learning Factor
- **K_c** Traffic Density in vpm
- **M** Man Power
- **n_{tasks}** Number of Tasks
- **n_{trials}** Number of Trials
- **NC** Normal Cost
- **NT** Normal Time *(Second)*
- **p** Probability of Success of Single Trial
- **$P_{binomial}$** Binomial Distribution
- **P_{normal}** Normal Distribution
- **$P_{poisson}$** Poisson Distribution
- **q** Probability of Failure of Single Trial
- **Q_i** Hourly Flow Rate in vph
- **RP** Reorder Point
- **S** Safety Stock
- **T** Target
- **t_0** Optimistic Time *(Second)*
- **t_p** Pessimistic Time *(Second)*
- **V_m** Avg. Travel Speed *(Kilometer per Hour)*

Constants, Functions, Measurements used in list of Industrial Parameters Formulas above

- constant(s): **pi**, 3.14159265358979323846264338327950288
  Archimedes' constant
- constant(s): **e**, 2.71828182845904523536028747135266249
  Napier's constant
- Functions: **log10**, log10(Number)
  The common logarithm, also known as the base-10 logarithm or the decimal logarithm, is a mathematical function that is the inverse of the exponential function.
- Functions: **sqrt**, sqrt(Number)
  A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- Measurement: **Time** in Second (s)
  Time Unit Conversion
- Measurement: **Speed** in Kilometer per Hour (km/h)
  Speed Unit Conversion

- W_T Work Hours *(Second)*
- **x** Specific Outcomes within Trials
- λ_a Mean Arrival Rate
- **μ** Mean of Distribution
- **ρ** Traffic Intensity
- **σ** Standard Deviation of distribution
- σ^2 Variance

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