เฉลยแบบทดสอบ FMC FORECAST USING RELIABILITY

Given:

MC (Mission Capable %) = PMC (Partial Mission Capable %) + FMC (Full Mission Capable %)

R(t) = Aircraft Reliability = MC / 100 = (PMC / 100) + (FMC / 100)

$R(t) = e^{-\lambda t}$; whereas e = natural log = 2.718281828, λ = Failure Rate and t = time (or flying hours)

$Ln(R(t)) = Ln(e^{-\lambda t}) = -\lambda t$ or Failure Rate $\lambda = Ln(R(t)) / -t$

Use the above given statements and empirical formulas to answer the following questions:

1. An aircraft fleet has flown 1 year with an average FMC of 70 % and an average PMC of 8 %. What is the aircraft reliability R(t) of that year ?

a. 0.70

b. 0.78

c. 0.80

d. 0.62

2. An aircraft fleet has flown 1 year with an average PMC of 5 % and the reliability of 0.75. What is the FMC (%) of this aircraft fleet ?

a. 60 %

b. 65 %

c. 70 %

d. 75 %

3. An aircraft fleet has flown 1 year with an average FMC of 72 % and the reliability of 0.72. What is the PMC (%) of this aircraft fleet ?

a. 0 %

b. 5 %

c. 8 %

d. 10 %

4. Given: Failure Rate λ = Ln(R(t)) / -t ..... and R(t) = $e^{-\lambda t}$

An aircraft fleet has flown 2,800 flying hours in year 2020 with an average MC of 66 %. This aircraft fleet is planned to fly 3,000 flying hours in year 2021. What is the aircraft MC forecast in the year 2021 ?

a. λ_1 = Ln(0.66) / (- 3,000); $MC_{year2021} = e^{-(\lambda_1 * 2,800)}$

b. λ_1 = Ln(0.34) / (- 3,000); $MC_{year2021} = e^{-(\lambda_1 * 2,800)}$

c. λ_1 = Ln(0.66) / (- 2,800); $MC_{year2021} = e^{-(\lambda_1 * 3,000)}$

d. λ_1 = Ln(0.34) / (- 2,800); $MC_{year2021} = e^{-(\lambda_1 * 3,000)}$

5. Given: Failure Rate λ = Ln(R(t)) / -t ..... and R(t) = $e^{-\lambda t}$

An aircraft fleet has flown 5,500 flying hours in year 2020 with an average MC of 72 %. This aircraft fleet is planned to fly 6,000 flying hours in year 2021. What is the aircraft MC forecast in the year 2021 ?

a. λ_1 = Ln(0.72) / (- 5,500); $MC_{year2021} = e^{-(\lambda_1 * -6,000)}$

b. λ_1 = Ln(0.72) / (6,000); $MC_{year2021} = e^{-(\lambda_1 * -5,500)}$

c. λ_1 = Ln(0.72) / (- 6,000); $MC_{year2021} = e^{-(\lambda_1 * 5,500)}$

d. λ_1 = Ln(0.72) / (- 5,500); $MC_{year2021} = e^{-(\lambda_1 * 6,000)}$

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