

NAME : SHAHSAUD ROSHAN

ID : 14502

Q Calculate the actual length of the Runway from the following data.

- ⇒ Airport elevation : R.L = 100.
- ⇒ Airport reference temperature : 30°C.
- ⇒ Basic length of runway : 800m.
- ⇒ Highest point along the length : R.L = 98.2.
- ⇒ Lowest point along the length : R.L = 95.2.

SOLUTION:

∴ CORRECTION OF ELEVATION

The basic length is to be increased at the rate of 7% per 300m elevation above mean sea-level.

∴ Correction for elevation: $800 \times \frac{7}{100} \times \frac{100}{300} = 1800$

length of runway after } = (800 + 18) = 818m.
Correction for elevation }

-: CORRECTION FOR TEMPERATURE :-

Standard atmospheric temperature at mean sea-level } = 15°C.

Taking the temperature gradient as equal to 6.5°C per 1000m rise in elevation, the standard temperature at the airport site will be:

$$\text{Temperature at R.L., 100} = 15 - \left[6.5 \times \frac{100}{1000} \right] = 14.35^\circ\text{C}$$

$$\left. \begin{array}{l} \text{Difference between airport} \\ \text{reference temperature } \& \text{ } \\ \text{Standard atmospheric temperature} \end{array} \right\} = (30 - 14.35) = 15.65^\circ\text{C}$$

Applying correction at the rate of 1% for every 1°C.

$$\begin{aligned} \text{Correction for temperature} &= \left(\frac{1}{100} \times 818 \right) \times 15.65 \\ &= 128.017 \text{ say } 128\text{m} \end{aligned}$$

Corrected runway length = $(818 + 128) = 946\text{m}$.

Effective gradient = $\frac{R.1 \ 98.2 - R.1 \ 95.2}{800}$

= $\frac{3}{800}$ or 0.003 .

Applying Correction for the effective gradient at the rate of 20% for each 1% effective gradient:

Correction for gradient = $\left[\frac{20}{100} \times 946 \right] \times \frac{0.003}{1}$

= 0.56 .

Actual length of runway = $(946 + 0.56)$

$946.56\text{m} \dots \dots$ Ans.

∴ CHECK :-

Total correction for elevation & temperature } = $(18 + 128) = 146\text{m}$.

Percentage increase = $\frac{146}{800} \times 100 = \boxed{18.25}$

According to ICAO, this should not be more than 35%.