ASSIGNMENT:-

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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: $800 \times \frac{7}{100} \times \frac{100}{300} = 18.66$

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

-: CORRECTION FOR TEMPERATURE :-

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

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

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

Difference between airport reference temperature & Standard atmospheric temperature } = (30 − 14 − 35) = 15.65°C.

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

Correction for temperature = $\left(\frac{1}{100} \times 818\right) \times 15.65$

= 128.017 say 128m

Corrected runway length = (818 + 128) = 946m.

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)

946.56m ..... Ans.

:CHECK:

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

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

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