Step 1 of 1

Let μ1 and μ2 be the true population mean of the method 1 and method 2 respectively.

**claim**: Is to test that, whether the two methods provide the same value for natural vibration frquency.

Given that,

significance level, α=0.05 (i.e. 5%)

sample size, n=7

R-Code For two sample t- mean test,

> x=c(14.58,48.52,97.23,113.99,174.73,212.72,277.38)

> y=c(14.76,49.10,99.97,117.53,181.22,220.14,294.80)

> t.test(x,y,var.equal=T,conf.level=0.95)

**Final Answer**

a) To test,

**H0 :**μ**1=**μ**2 Vs H1:**μ**1**≠μ**2**

**R-output:**

Two Sample t-test

data: x and y

t = -0.10717, df = 12, p-value = 0.9164

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

-116.9212 105.9583

sample estimates:

mean of x mean of y

134.1643 139.6457

**t-value=-0.10717 & p-value=0.9164**

**Decision rule:**

We reject H0 at α% level of significance level if,

P-value<α

here , P-value > α i.e 0.9164>0.05

Therefore, we do not reject H0 at 5% level of significance.

**Conclusion:**

There is sufficient evidence to suggest that the two methods provide the same mean value for natural vibration frequency.

b)here we have to construct a 95% confidence interval on the mean difference between the two methods.

**95 percent confidence interval:**

**-116.9212 105.9583**

**Ans: (-116.9212 , 105.9583)**