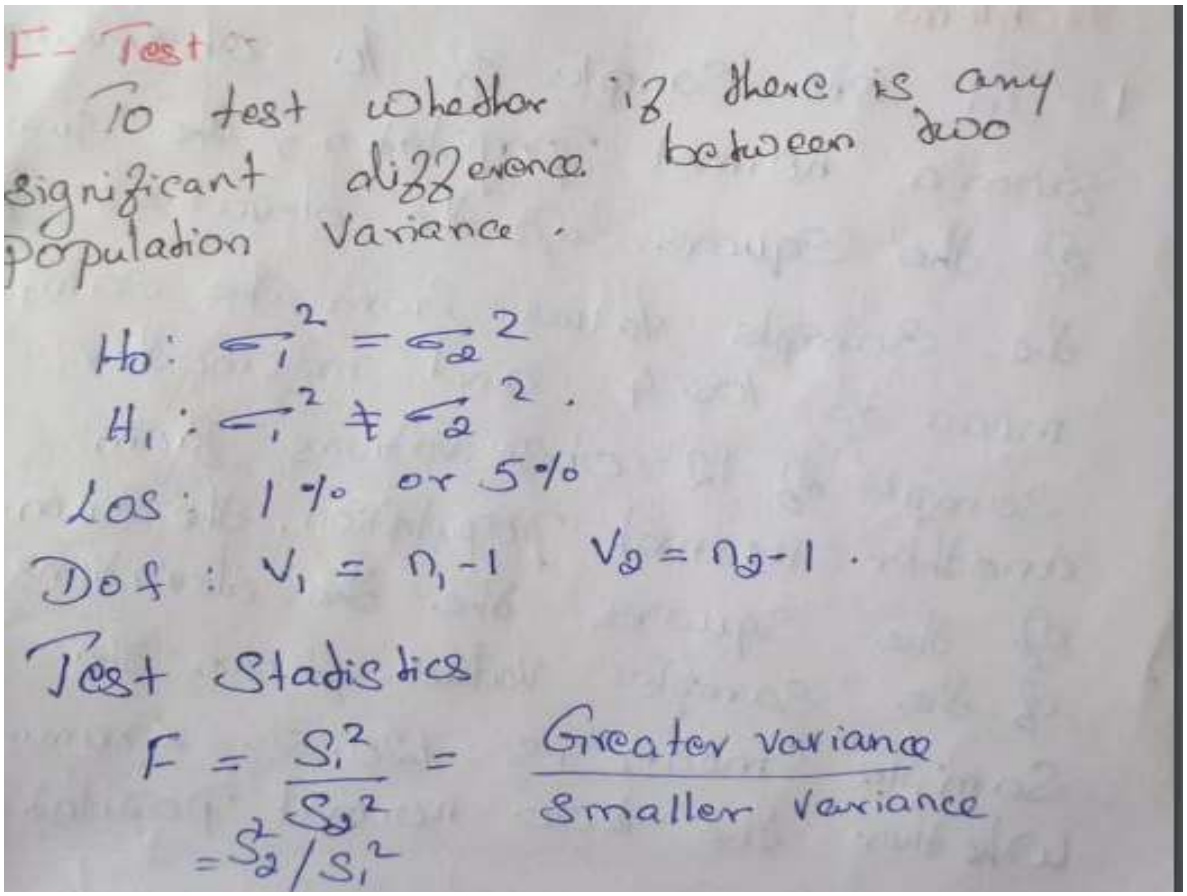
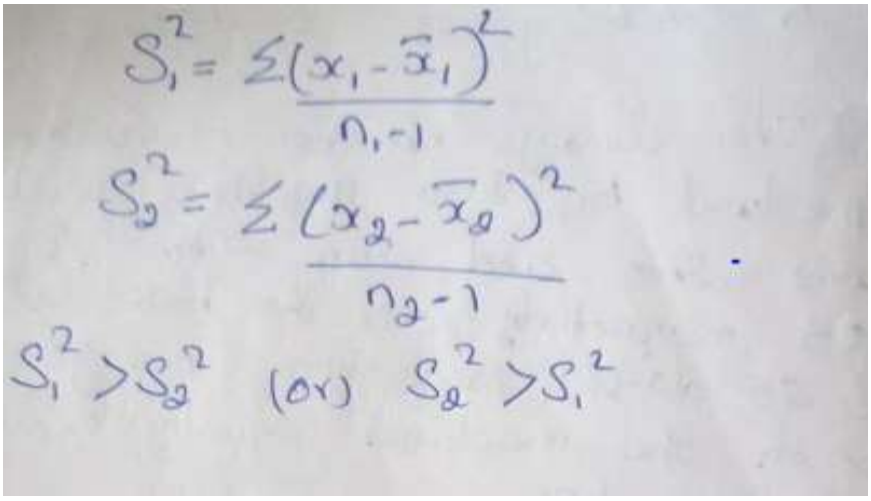
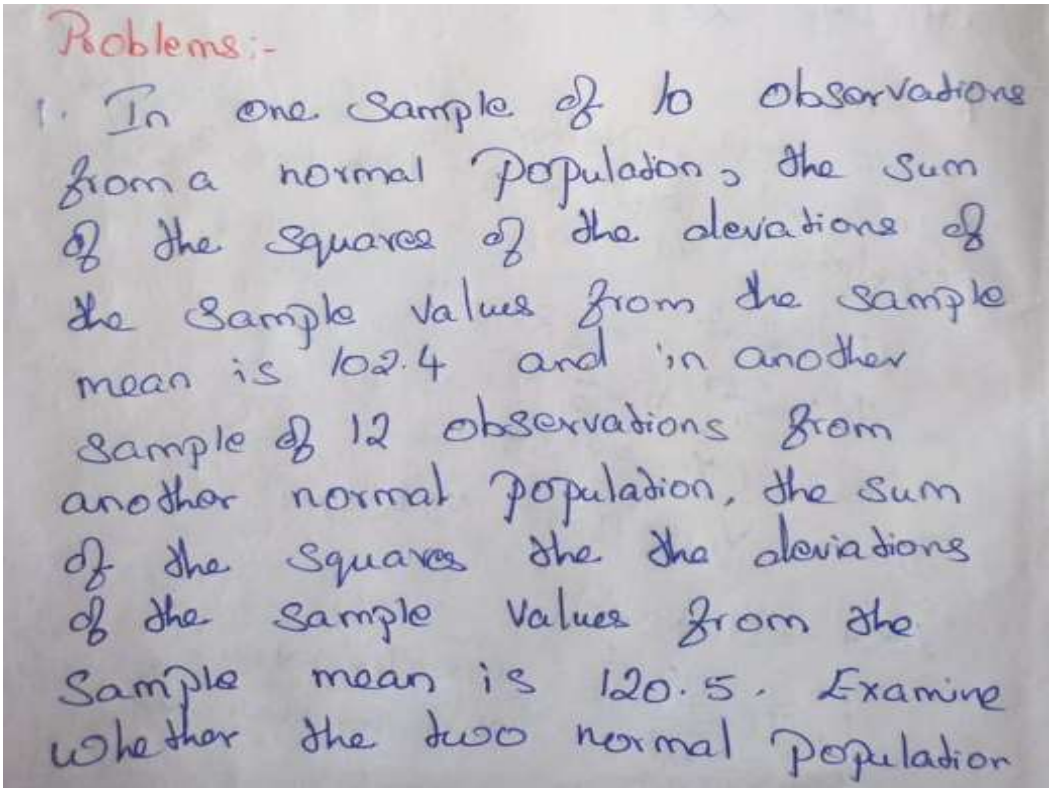
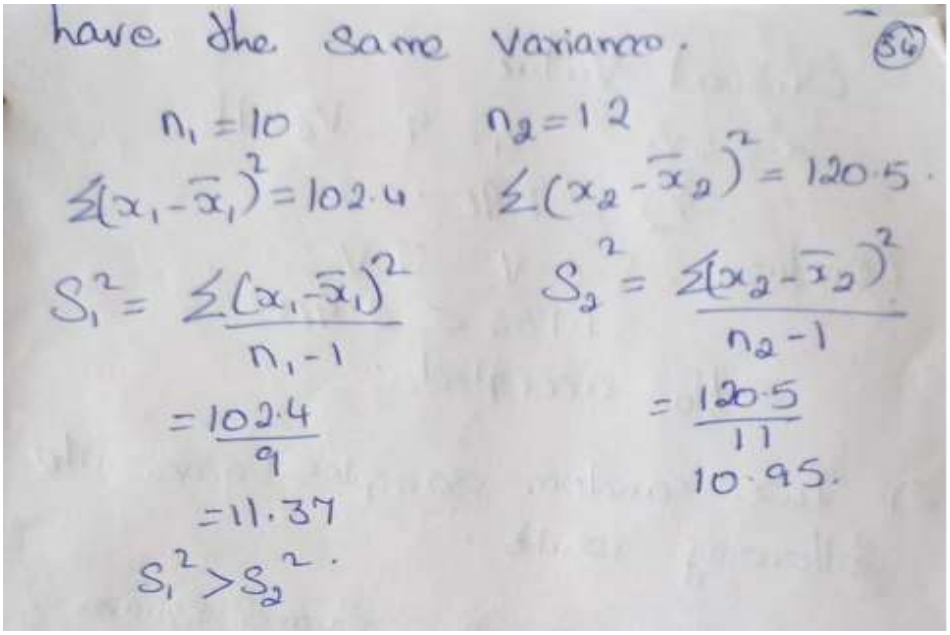
Topic: 1.8 – F distributions






Problems:-

1. In one sample of 10 observations from a normal population, the sum of the squares of the deviations of the sample values from the sample mean is 102.4 and in another sample of 12 observations from another normal population, the sum of the squares the the deviations of the sample values from the sample mean is 120.5. Examine whether the two normal population


have the same variance. (54)

$n_1 = 10$ $n_2 = 12$

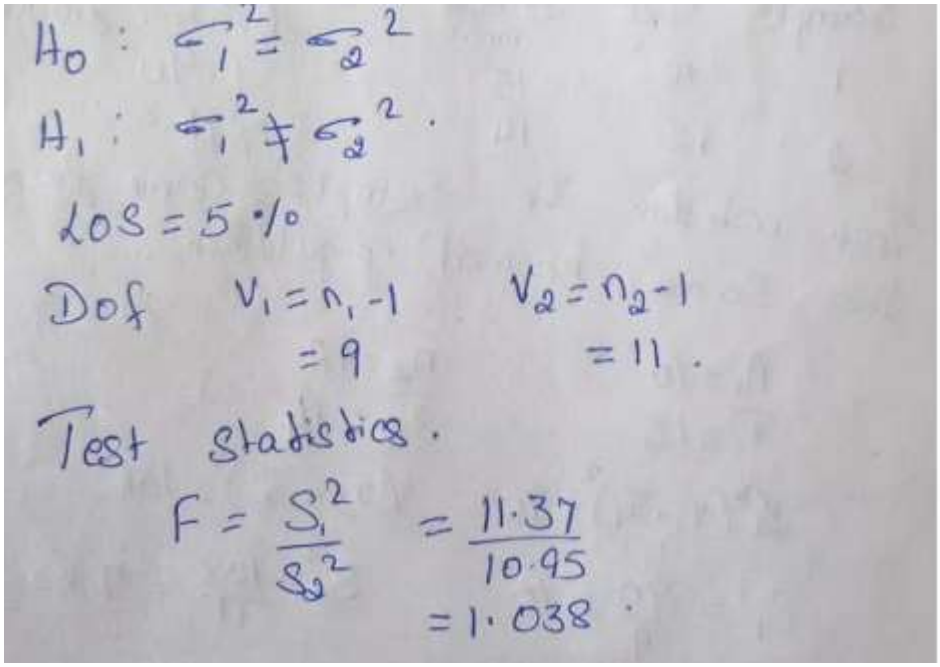
$\Sigma(x_1 - \bar{x}_1)^2 = 102.4$ $\Sigma(x_2 - \bar{x}_2)^2 = 120.5$

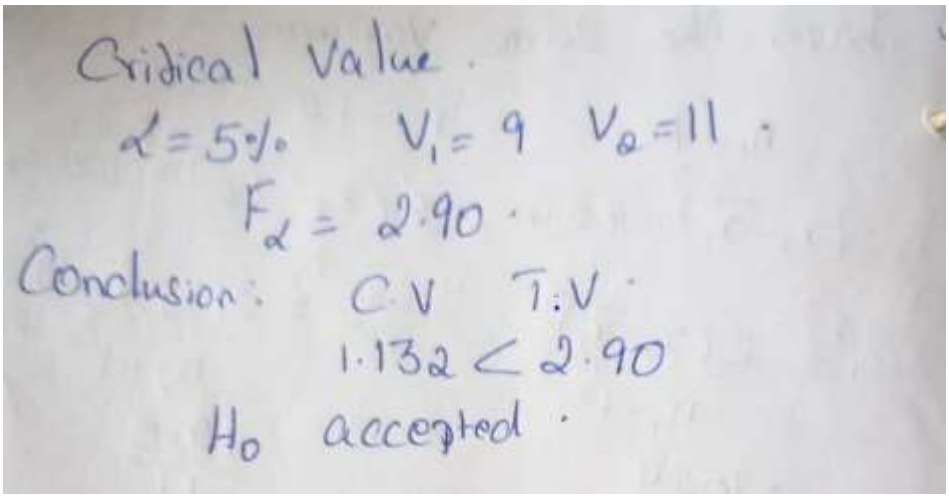
$S_1^2 = \frac{\Sigma(x_1 - \bar{x}_1)^2}{n_1 - 1}$ $S_2^2 = \frac{\Sigma(x_2 - \bar{x}_2)^2}{n_2 - 1}$

$= \frac{102.4}{9}$ $= \frac{120.5}{11}$

$= 11.37$ $10.95.$

$S_1^2 > S_2^2.$


$H_0 : \sigma_1^2 = \sigma_2^2$
$H_1 : \sigma_1^2 \neq \sigma_2^2$.
LOS = 5 %
Dof $V_1 = n_1 - 1 = 9$ $V_2 = n_2 - 1 = 11$.
Test statistics.
$F = \frac{S_1^2}{S_2^2} = \frac{11.37}{10.95} = 1.038$.


Critical value.
$\alpha = 5\%$ $V_1 = 9$ $V_2 = 11$.
$F_\alpha = 2.90$.
Conclusion: C.V T.V
$1.132 < 2.90$
H_0 accepted.