1.

A) 407 genes are found to express higher in ALL group

B)

[1,] "3.80322050512871e-05" "Macmarcks"

[2,] "3.80322050512871e-05" "VIL2 Villin 2 (ezrin)"

[3,] "3.80322050512871e-05" "TCF3 Transcription factor 3 (E2A immunoglobulin enhancer binding factors E12/E47)"

These are the top 3 with the smallest p value. As the p value are nearly 0 these 3 genes are very probably expressed higher.

2.

225 genes do not pass the test.

3.

H0: HOXA9 and CD33 express the same in ALL patients

H1: HOXA9 and CD33 express different in ALL patients

We use two side Wilcoxon signed rank test for HOXA9 and CD33, and get the result of p-value = 0.01242. As p value is smaller than 0.05 so that we reject H0 so that HOXA9 and CD33 express different in ALL patients.

4.

A	B	C	D	E	F
5.205468e-05	7.705041e-01	4.261753e-01	6.378283e-01	3.686981e-01	6.403817e-01

Only Dept A p values is below 0.05, the rest Dept are all much higher than 0.05 for both fisher test and chisq test. So for Dept A, gender and admission decision is not independent.

5.

H0: the variance in ALL group is equal or greater than the variance in the AML group
HA: the variance in ALL group is smaller than the variance in the AML group

P = 0.036. It is smaller than 0.05 so that we could reject H0 so that the variance in ALL group is smaller than the variance in the AML group