Q1

Exercise 64 on page 531.

Low dose gains:
$s_1 = 54\text{g}$, $m = 23$
Control gains:
$s_2 = 32\text{g}$, $n = 20$

Test statistic:
$f = \frac{s_1^2}{s_2^2} = \frac{54^2}{32^2} = 2.848$

Hypotheses:
$H_0 : \sigma_1^2 = \sigma_2^2$
$H_\text{a} : \sigma_1^2 > \sigma_2^2$ (low dose variability $>$ control variability)

Rejection Region:
$f \geqslant F_{\alpha,m-1,n-1}$

$F_{\alpha,23-1,20-1} = 0.4799 < f$

The test statistic f is in the rejection region so the null hypothesis, which states that the variability of the control gains equals the variability of the low dose gains, can be rejected at the significance level $\alpha = 0.05$.