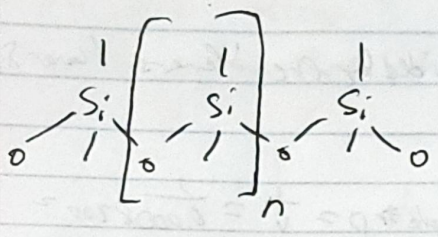
CM 362 Quiz 3 I pledge my honor that I have abided by the Stevens Honor System. - Natalie

1)



2b. a) 13.35 min.
The injector temperature has no effect on retention time.

c. f) 16.55 min.
Decreasing the oven temperature allows the analyte to interact more with the stationary phase as it decreases volatility, therefore retention time increases.

d. k) 10.25 min
Increasing carrier gas flow rate increases the amount of gas that can carry the analyte to the detector, therefore decreasing retention time.

e. m) 13.35 min.
The detector temperature has no effect on retention time.

3.

Name	Formula	n	(min) retention time	adjusted retention time (min)	$\log_{10}$ adjusted retention times
methane	CH_4	1	0.51	0.51 − 0.51 = 0.00	—
octane	C_8H_{18}	8	14.28	14.28 − 0.51 = 13.77	1.1389
nonane	C_9H_{20}	9	18.35	18.35 − 0.51 = 17.84	1.2514
unknown	—	—	13.35	13.35 − 0.51 = 12.84	1.1086

$$RI_{(u)} = 100\left(n + (N-n)\frac{\log_{10}t'_{r(u)} - \log_{10}t'_{r(n)}}{\log_{10}t'_{r(N)} - \log_{10}t'_{r(n)}}\right) = 100\left(8 + (9-8)\frac{1.1086 - 1.1389}{1.2514 - 1.1389}\right)$$

$$= 773.067$$

4. C because increasing retention time is based on decreased volatility, which is inversely proportional to boiling point. Therefore, increasing retention time order is the same as decreasing boiling point order.