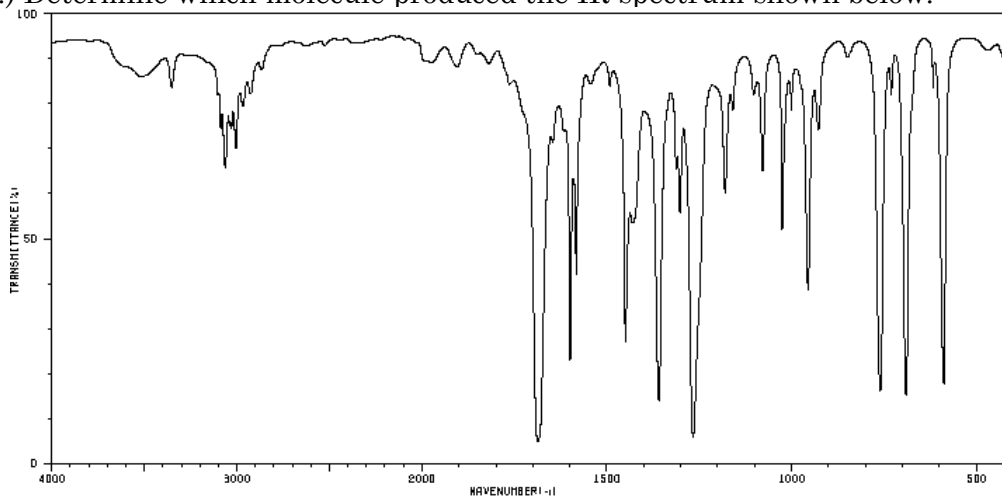
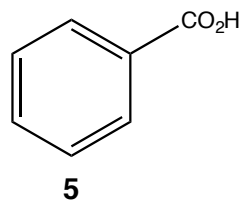
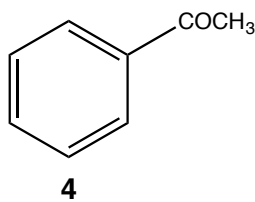
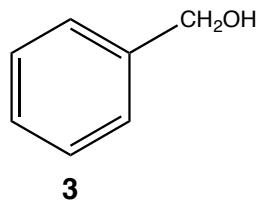
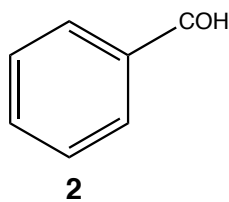
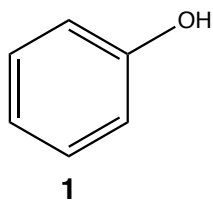


Spectral data obtained from the National Institute of Advanced Industrial Science and Technology, Japan (<http://sdb.s.riodb.aist.go.jp>)

1. a. (10 pts.) Determine which molecule produced the IR spectrum shown below.



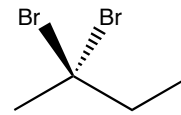
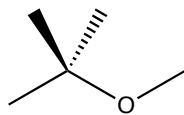
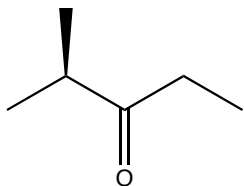
3604	84	2967	77	1645	81	1267	6	956	37
3352	81	2925	79	1492	81	1181	58	928	72
3087	72	2867	84	1450	26	1160	74	761	15
3063	64	1686	4	1430	62	1103	79	731	79
3040	72	1648	68	1360	13	1079	62	691	14
3029	72	1599	21	1315	82	1025	50	618	61
3006	68	1583	41	1303	63	1001	74	588	17



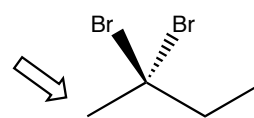
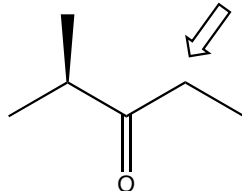
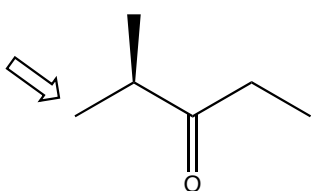
b. (12 pts.) Explain why you eliminated each molecule from consideration.

c. (4 pts.) Explain why the molecule you chose is consistent with the IR spectrum.

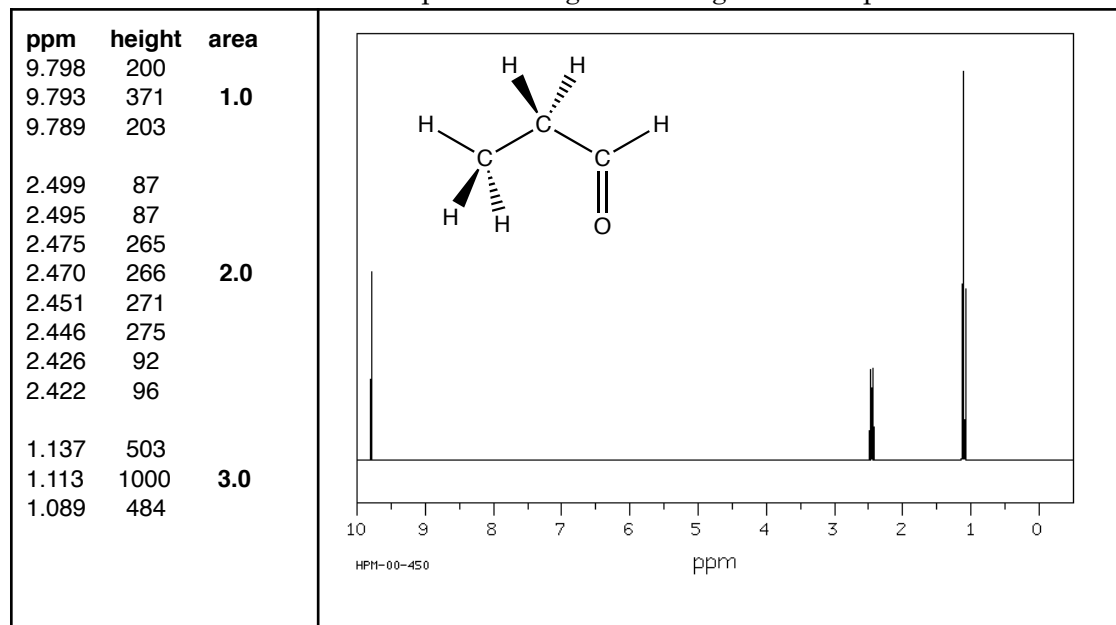
2. (9 pts.) Determine the number of peaks that are expected in a  $^1\text{H}$  NMR spectrum of the following molecules.



3. (9 pts) What is the multiplicity (what pattern do you expect) for the indicated proton(s).



4. a. (9 pts.) Assign (match) the peaks in the following NMR spectrum to the protons on the structure drawn below. A peak listing with integrations is provided on the left.



b. (9 pts.) Explain how you made your assignments for each peak.