(10pts) For problems 1-5, refer to the IR spectrum handout. Write the letter of the spectrum that matches each of the following molecules.

1. ______
   ![Molecule 1](image1)

2. ______
   ![Molecule 2](image2)

3. ______
   ![Molecule 3](image3)

4. ______
   ![Molecule 4](image4)

5. ______
   ![Molecule 5](image5)

6. (2pts) How could IR be used to determine if this reaction is complete?

   ![Reaction](image6)

   1. LAH
   2. H₂O

   ->

   ![Products](image7)

   CH₃OH
7. (3pts) This is the spectrum for 3,4-dihydropyran, shown below. The most intense characteristic peak is at 1649 cm$^{-1}$. Which bond stretch causes this absorption? Why is it so intense?

![Spectrum Image]

8. (3pts) What major IR absorption(s) are present above 1500 cm$^{-1}$ for this compound?

![Benzyl alcohol structure]

9. (2pts) A small peak is observed at 3420 cm$^{-1}$ for this compound. The student was sure that there was no water impurity in the sample. What other reason could account for this peak?

![Propionyl group structure]