Word process all answers. Figures may be hand drawn. Undergraduate students answer question 3 and any four other questions. Graduate students answer all six questions.

1. In what way(s) is the Harpy solution to speech recognition not realistic if we want to tackle the entire language and not have a restriction on the words in the lexicon or the grammatical structure of those words? Would Hearsay suffer from the same problem if we wanted to solve the problem for the entire language? Explain.

2. Do problem 1 on page 667. Make sure you answer the part of the question that asks at what part of the process (syntactic analysis, semantic analysis, etc) the problem is detected.

3. Similar to the figure on slide 18 of the notes, provide the parse, semantic interpretation and contextual interpretation for the following sentences. Provide 1 parse tree per sentence, 1 conceptual graph per sentence, and then a combined conceptual graph for the contextual interpretation.
   The man with the big dog ate a biscuit.
   The biscuit made him sick.
   He thought that it was a dog biscuit.

4. Given the following grammar, provide the RTN that would be generated by it. You should draw this not as a single figure but as several different RTNs. The number you use can vary based on how you feel it is best presented.
   \[
   \begin{align*}
   S & \rightarrow \text{NP} \text{ VP} | \text{VP} \\
   \text{NP} & \rightarrow \text{[art]} \text{ [adj]* N [REL_CLAUSE] PP} | \text{that S} \\
   \text{N} & \rightarrow \text{noun} | \text{pronoun} | \text{personal_noun} \\
   \text{PP} & \rightarrow \text{prep NP} \\
   \text{VP} & \rightarrow \text{[aux]* verb [NP]} | \text{[aux]* verb [PP]} \\
   \text{REL_CLAUSE} & \rightarrow \text{relation verb [adv]*} \\
   \end{align*}
   \]
   Note: items in [ ] are optional, the * means 0 or more instances may occur.

5. Provide case grammars for the following verbs:
   a. to listen
   b. to construct
   c. to threaten
   d. to sleep
   e. to push

6. Similar to the job ad template (see slide 51 of the chapter 15 notes or page 663 of the textbook), provide a template that we might use for an article about some sports event (select the type of event, for instance a baseball game, a football game, a tennis match, etc). You might want to look at a couple of actual articles before creating your template. Select whatever type of sporting event you like.