

Mock Exam

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You have to reach more than 50% of the points to pass.

1 Predicate Logic

Task 1: Ambiguous sentences (7 points)

Consider the following ambiguous sentences:

- (1)
 - a. Duncan trusted Macbeth because he was a thane.
 - b. Every king trusts a thane.
 - c. Macbeth and Macduff are married.
 - d. Macbeth killed a king with a dagger.

1. For **each** of these, determine the type of ambiguity.
2. Pick **one** of the sentences provide an unambiguous paraphrase for the possible readings.

Task 2: Model and Interpretation (7 points)

(Note: For this task you do not need to use the functional notation and the types)

1. Define a universe that consists of Macbeth and Banquo.
2. Define the interpretation of the names **macbeth** and **banquo** in an intuitively plausible way.
3. Define the interpretation of the properties **thane**, **king**, and **witch** in such a way that Macbeth is a king, both are thanes and neither is a witch.
4. Define the interpretation of the 2-place relations **mistrust** and **kill** in such a way that Macbeth and Banquo mistrust each other and Macbeth kills Banquo.

Task 3: Formulæ (7 points)

Write down logical formulæ that express the meaning of the following sentences.

1. Banquo is a thane.
2. Macbeth is king and Macbeth mistrusts Banquo.
3. If Banquo is king then Macbeth does not kill Banquo.

Task 4: Interpreting formulæ (8 points)

Compute the interpretation of the following formulæ step by step.

1. $\text{mistrust}(\text{macbeth}, \text{macbeth})$
2. $\neg \text{king}(\text{banquo})$
3. $\text{witch}(\text{banquo}) \supset \text{king}(\text{macbeth})$

Task 5: Variables (2 points)

Provide a g-function that maps the variables x , y , and z to individuals from the universe and compute the interpretation of the following formula with respect to the model and your g .

- (i) $\text{kill}(z, x)$

Task 6: Quantifiers

Provide logical formulæ that express the meaning of the following sentences. Are the formulæ true in **your** model (not in the entire play)? Give a short reason (you don't need to compute the truth value).

- Banquo was killed by a king.
- Macbeth mistrusts every witch.

2 Lexical Resource Semantics

Task 7: Analysis: Lexicon

Provide the lexical entries for the words in the sentence *Banquo mistrusted Macbeth*. Use the features as given in figure 1. You may work with the simplified AVM.

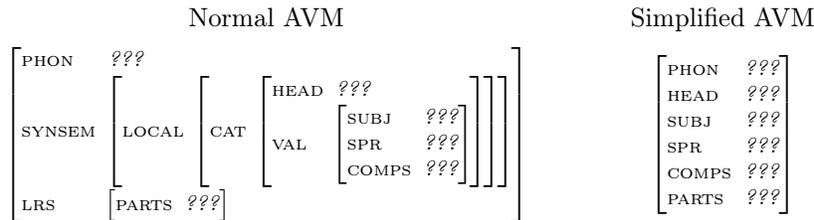


Figure 1: Features used in AVMs

Task 8: Analysis: Syntactic structure and semantic combinatorics (10 points)

Using the lexical entries from Task 7, provide the syntactic structure of the sentence *Banquo mistrusted Macbeth*. Indicate **all** the values for all features at each node in the tree.

Task 9: General mechanisms of LRS (12 points)

- Enumerate all possible logical forms that our grammar predicts for this sentence. Are they all intended?
- Use the PARTS values to show that the following expressions are excluded as possible logical forms of the sentence?
 - $((\text{mistrust} \bullet \text{macbeth}) \bullet \text{banquo}) \bullet \text{banquo}$
 - $((\text{mistrust} \bullet \text{banquo}) \bullet \text{banquo})$
 - $((\text{macbeth} \bullet \text{mistrust})\text{banquo})$

Task 10: Local semantic phenomena (3 points)

What kind of semantic restriction is violated in the deviating forms of the following sentences? Give a reason for your decision.

- [Lady Macbeth's madness]/#[The crazy queen] started after Duncan's death.
- Macbeth killed [the king]/?[his honourableness].