PES University, Bangalore

Department of Computer Science and Engineering

Automata Formal Languages & Logic

QB for First Order Logic- Quantifiers, Terms, Axioms

1. **Given Vocabulary statement, write it in Clausal Forms in FOL**

   All people who are not poor and are smart are happy. Those people who read are not stupid. John can read and is wealthy. Happy people have exciting lives.

2. Given vocabulary statements, write it in clausal forms in FOL.
   All dogs are animal. 2. Fido is a dog. 3. All animals will die.

3. Consider the following axioms: write it in clausal forms in FOL.

   1. Anyone who buys carrots by the bushel owns either a rabbit or a grocery store.
   2. Every dog chases some rabbit.
   3. Mary buys carrots by the bushel.
   4. Anyone who owns a rabbit hates anything that chases any rabbit.
   5. John owns a dog.
   6. Someone who hates something owned by another person will not date that person.
   7. If Mary does not own a grocery store, she will not date John.

4. Consider the following axioms: write it in clausal forms in FOL.

   1. Every Austinite who is not conservative loves some armadillo.
   2. Anyone who wears shirts is an Aggie.
   3. Every Aggie loves every dog.
   4. Clem is an Austinite, and Clem wears shirts.
   5. There a conservative Austinite?

5. Consider the following axioms: write it in clausal forms in FOL.

   1. Anyone whom Mary loves is a football star.
   2. Any student who does not pass does not play.
   3. John is a student.
   4. Any student who does not study does not pass.
   5. Anyone who does not play is not a football star.
   6. If John does not study, then Mary does not love John.

6. Consider the following axioms: **write it in clausal forms in FOL.**

1. Every coyote chases some roadrunner.
2. Every roadrunner who says ``beep-beep'' is smart.
3. No coyote catches any smart roadrunner.
4. $\forall x\ (COYOTE(x) \wedge \exists y\ (RR(y) \wedge CHASE(x,y) \wedge \neg\ CATCH(x,y)) \rightarrow FRUSTRATED(x))$
5. If all roadrunners say ``beep-beep'', then all coyotes are frustrated.