

# PES University, Bangalore

Department of Computer Science and Engineering

Automata Formal Languages & Logic

## QB for Propositional Theorem Proving- Inference Rule AND Resolution Algorithm

### Problem:

1. What is Conjunctive normal form.
2. Write the steps to perform the resolution over a given set of facts.
3. What is a knowledge Base.
4. Write the rule of implication and bidirectional.
5. Write the Demorgan's law for negation over conjunction and Disjunction
6. Write the BNF grammar and explain.
7. What do you understand from Modus Ponens and And-Elimination rule. Explain.
8. Mention the rule of associative and distributive property.
9. Given axioms  $P \wedge ((P \wedge Q) \rightarrow R) \wedge ((S \vee T) \rightarrow Q) \wedge T$   
Prove R using Resolution algorithm.

### 10. Given

- a. John is in Paris or John is in Australia
  - b. If John is in Paris, then It is raining
  - c. If John is in Australia, then It is raining
- DO the following
1. Write the clauses
  2. Convert it in CNF form
  3. **Prove** It is raining using Resolution.