

PSG COLLEGE OF TECHNOLOGY
DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCES
M.Sc (TCS) – 15XTEI - ARTIFICIAL INTELLIGENCE

PROBLEM SHEET-II

1. Represent the following statements using propositional logic.
 - (a) if Paola is happy and paints a picture then Renzo isn't happy.
 - (b) x being prime is a sufficient condition for x being odd.
 - (c) Either Aldo is Italian and Bob is English, or neither Aldo is Italian nor Bob is English.
2. Use inference to verify whether the following statements are logically correct.
 - (a) If I'm guilty, I must be punished; I'm not guilty. Thus I must not be punished.
 - (b) If I'm guilty, I must be punished; I'm guilty. Thus I must be punished.
 - (c) If Carlo won the competition, then either Mario came second or Sergio came third. Mario didn't come second. Thus, if Carlo won the competition, then Sergio didn't come third.
3. Represent the following statements using FOL.
 - (a) For all X , if X is mortal then X is a person
 - (b) Frank bought a dvd
 - (c) Susan bought everything that Frank bought.
 - (d) Everyone bought something
 - (e) Someone bought everything
4. Use inference to verify whether the following statements are logically correct .
 - (a) Anyone who buys carrots by the bushel owns either a rabbit or a grocery store. Every dog chases some rabbit. Mary buys carrots by the bushel. Anyone who owns a rabbit hates anything that chases any rabbit. John owns a dog. Someone who hates something owned by another person will not date that person. Conclusion: If Mary does not own a grocery store, she will not date John.
 - (b) Every child loves Santa. Everyone who loves Santa loves any reindeer. Rudolph is a reindeer, and Rudolph has a red nose. Anything which has a red nose is weird or is a clown. No reindeer is a clown. Scrooge does not love anything which is weird. Therefore Scrooge is not a child.