



THE OPEN UNIVERSITY OF SRI LANKA  
 BSc (IT) DEGREE PROGRAM: LEVEL 04  
 NO BOOK TEST (NBT): SEMESTER 01 – 2023/2024  
 COU4201: KNOWLEDGE REPRESENTATION AND LOGIC PROGRAMMING

DURATION: ONE HOUR (1 HOUR)

Date: 24.03.2024

Time: 10.30 a.m. to 11.30 a.m.

Answer ALL questions.

Q1.

1. Explain why **reasoning** is crucial in knowledge-based systems using your own example. [10 marks]
2. “A quantifier is a language element which generates quantification, and quantification specifies the quantity of specimen in the universe of discourse.”  
State and describe two (02) types of quantifiers with suitable examples. [15 marks]
3. Write First Order Logic statements using quantifiers for the following English Sentences.
  - a. All birds fly.
  - b. Every man respects his parents.
  - c. Some boys play cricket.
  - d. Not all students like both Mathematics and Science.
  - e. Not all students like both Mathematics and Science.[25 marks]

Q2. Consider the following English sentences from 1 to 4 to answer the question given below.

Using the following sentences prove the resolution:

**If John is a light sleeper, then John does not have any mice.**

1. All hounds howl at night.
2. Anyone who has any cats will not have any mice.
3. Light sleepers do not have anything which howls at night.
4. John has either a cat or a hound.

*Hint: The steps for resolution are;*

- *Conversion of facts into first-order logic (FOL)*
- *Convert FOL statements into CNF*
- *Negate the statements into which needs to prove (proof by contradiction)*
- *Draw resolution graph (unification).*

[50 marks]

