

**Tribhuvan University**  
**Institute of Science and Technology**  
**2072**

**Bachelor Level/ Third Year/ Fifth Semester/ Science**

**Full Marks: 60**

**Computer Science and Information Technology (CSc. 304)**

**Pass Marks: 24**

**(Artificial Intelligence)**

**Time: 3 hours**

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

**Attempt all questions. (10x6=60)**

1. Define backward chaining. Explain the importance of backward chaining with two practical examples.
2. Justify that “System that think rationally” and “System that act rationally” are the part of artificial intelligence. Explain it with practical examples.
3. How do you convert to conjunctive normal form? Explain all the steps with examples.
4. “A key property of deductive systems is that they are purely syntactic, so that derivations can be verified without considering any interpretation. Thus a sound argument is correct in every possible interpretation of the language, regardless whether that interpretation is about mathematics, economics, or some other area. The artificial intelligence deals with deductive system soundly”. Represent the above sentences in first-order logic and explain each step.
5. Searching is an important part of AI, justify it. Explain any two types of blind search with suitable examples.  
How can you expand it to informed search?
6. What is learning by induction? Explain inductive learning process with example.
7. What do you mean by reasoning in belief network? Explain it with example.
8. Derive the mathematical model of neural network. Explain any one type of neural network with its algorithm.
9. Why do we require expert system structure? Draw the block diagram and explain it with practical example.

10. Explain the different steps involved in the natural language processing (NLP) with block diagram and examples.