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 the questions. (10x6=60)

1. What do you mean by forward chaining? Why it is required? Explain it with two practical examples.

2. "System that think like humans" and "System that act like humans" are the part of artificial intelligence. Justify that statement with practical examples.

3. Why normal forms are required in AI? How do you convert to the disjunctive normal form? Explain all the steps with practical examples.

4. "A deductive system is sound if any formula that can be derived in the system is logically valid. Conversely, a deductive system is complete if every logically valid formula is derivable. All of the system discussed in this article are both sound and complete. They also share the property that it is possible to effectively verify that a purportedly valid deduction is actually a deduction; such deduction systems are called effective".

Represent the above sentences in first-order logic and explain each step.

5. Justify that AI can't exist without searching. Explain in detail about any two types of informed search with practical examples.

6. Why do we require learning? Explain about learning framework with suitable block diagram and examples.

7. What do you mean by casual network? Explain it with practical application.

8. What is a Neural Network? Explain any one type of neural network with practical example.

9. Knowledge consists of facts, beliefs, and heuristics, justify it. Explain the advantages and disadvantages of an expert system.

10. Differentiate between natural language understanding (NLU) and natural language generating (NLG). Why we have to study natural language processing? Explain it.