Tribhuvan University
Institute of Science and Technology
2067
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Bachelor Level/ Second Year/ Fourth Semester/ Science — Full Marks: 60
Computer Science and Information Technology (CSc. 255) — Pass Marks: 24
(Introduction to Cognitive Science) — Time: 3 hours.

All questions carry equal marks.
Candidates are required to give their answer in their own words as for as practicable.

Attempt all the questions.

1. Why cognitive science is important in the computer science? Compare it with philosophy and explain it with suitable examples.

2. Define and explain artificial intelligence. Act rationally is an important part of artificial intelligence, justify it with suitable example.

3. The object based system can represent knowledge, explain it with practical examples.

4. Explain the algorithm of breath first search with suitable example. How can you modify it, explain.

   OR

   What do you mean by A* search? Explain it with an algorithm and suitable example.

5. Why Turing machine is required? Design a Turing machine with finite west of states as q0, q1, and q2, alphabets are "a" and "b", initial state is q0 and assume 5 suitable transitions.

6. List down the all Chomsky hierarchies. Explain in detail about type 0 with practical examples.

7. Explain the mathematical model of neural network system with suitable example. Also explain the importance of neural networks.

8. Explain the perceptron with suitable practical example and algorithm.

9. Explain penrose approach in the cognitive science. What is its relations with Descartes, explain with suitable example.

10. Why lexicon and morphology are required in natural language processing, explain suitable example?

    OR

    What are the parameters of language processing? Explain in detail about syntax with suitable example.

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1. Compare cognitive science with sociology and explain it with examples. Differentiate between linguistics of artificial intelligence?

2. Differentiate between think humanly and act humanly with suitable examples. What are the applications of artificial intelligence?

3. What do you mean by first order predicate logic? Explain it with practical example

4. Differentiate between depth first search and breadth first search with example.

OR

Differentiate between hill-climbing search and A* search with example.

5. Design a Turing machine with finite set of states as q_0 and q_1, alphabets are 'a', 'b', and 'c', initial state is q_0 and assumes 5 suitable transitions. What are the practical applications of Turing machine

6. Differentiate between type I and type II Chomsky hierarchies with examples. Explain the role of Chomsky hierarchy in the computation?

7. Explain the biological neuron. Explain the mathematical model of neural network system with suitable example.

8. Explain the back propagation practical example and algorithm.

9. Explain Searle approach in the cognitive science. What is its relation with Descartes, explain with example.

10. How can you generate parse tree in the natural language processing? Explain it with example.

OR

Differentiate between syntax and semantics in the natural language processing. How can you modify it with pragmatic approach?