

Tribhuvan University
Institute of Science and Technology

2072

Bachelor Level/ Second Year/ Forth Semester/ Science

Full Marks: 60

Computer Science and Information Technology (CSc.255)

Pass Marks: 24

(Introduction to Cognitive Science)

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.

1. How can you define connectionist computational cognitive science model? How far theories and principles of psychology are interrelated to the cognitive science theories? (3+3)
2. How Descartes justified mind-body problem with his popular wax argument? What was the response of Turing to his demonstration? (6)
3. How important computation is in cognitive science? What components a Physical Symbol System (PSS) consists of? Construct a PSS for Arithmetic Computation.
4. Define elements of a computing model. Why Turing machines are considered as a useful model to the real computers? (2.5+3.5)
5. How Artificial Neural Networks can exploit the self-Organization capability? Construct a multilayer recurrent neural network with at least six neuron nodes. Allocate the required input, weights and activation function with your own assumption. Finally, compute the mathematical expression for final output of the network.
6. How morphological analysis is done? In language understanding models, how ambiguities in languages can be addressed by pragmatic analysis? (2.5+3.5)
7. What do you mean by Qualia? How Gelernter uses this term to define consciousness? What was his response to mind-body problem? (2+2+2)
8. Why learning is important in Neural Network? How Hebbian Learning can be used to train Neural Networks? Illustrate with an example? (1+5)
9. How hill climbing search works in a state space? How can you say that hill climbing search is not complete? Support your answer with an example. Configure the required state space and assign the heuristic with your own assumptions. (6)
10. What do you mean by inferential adequacy property of knowledge representation system? How resolution can be used to infer conclusions in predicate logic? Mention the steps with an example. (1+5)