POKHARA UNIVERSITY

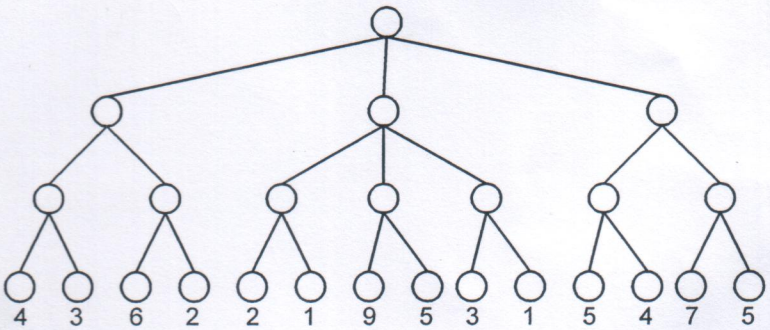
Level: Bachelor Semester: Fall Year : 2019
Programme: BE Full Marks: 100
Course: Artificial Intelligence and Neural Network Pass Marks: 45
Time : 3hrs.

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. a) Explain how forward and backward chaining are used to solve problems with suitable example. 8
   b) Formulate the 8-puzzle problem. Also draw a search free for the problem from an initial state to a goal state. 7
2. a) What is a task environment? How is it specified? Give an example of PEAS description for an automated taxi. 7
   b) What are the drawbacks of propositional logic? How are they resolved in predicate logic? Explain with examples. 8
3. a) Explain the concept of Semantic Networks and Frames with a suitable examples. 7
   b) Complete following tree using standard notations used for min-max tree. Also, determine the nodes to be pruned using alpha-beta pruning algorithm to find alpha-cutoff and beta-cutoff. 8



4. a) Represent the following facts using first order logic 8

i. Anyone whom Sophie loves is a cricket star.
ii. Any student who does not pass does not play.
iii. Paras is a student.
iv. Any student who does not study does not pass.
v. Anyone who does not play is not a cricket star.

Use the resolution to prove: If Paras does not study, then Sophie does not love Paras.

b) What is learning by analogy? Explain with suitable examples. 7

5. a) What is Genetic Algorithm? Use genetic algorithm to find the maximum value of a function $f(x) = 15x - x^2$, where $0 \leq x \leq 15$ and take population size of 4. 8

b) What do you mean by an Expert System? Write some of its important characteristics. How is Knowledge Acquisition process undertaken during Expert System development? 7

6. a) How does a Content Addressable Memory help in information retrieval? Describe about Hopfield network. 8

b) Write the importance of Natural Language Processing. Write in details about different levels of Analysis in NLP. 7

7. Write short notes on: **(Any two)** 2×5

a) Multi-layer perception
b) Machine vision
c) Bayesian Networks