POKHARA UNIVERSITY

Level: Bachelor Semester: Fall Year : 2018
Programme: BE Full Marks: 100
Course: Artificial Intelligence and Neural Networks 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) What do you mean by AI? Can AI be threat to humans in near future? Give your opinion. 3+4
   b) What is Means-Ends Analysis? How problems can be solved using MEA? Explain with the help of suitable example. 2+6
2. a) You are given two jugs, a 4-gallon one and a 3-gallon one, a pump which has unlimited water which you can use to fill the jug, and the ground on which water may be poured. Neither jug has any measuring markings on it. How can you get exactly 2 gallons of water in the 4-gallon jug? 7
   i) Formulate the problem as a search
   ii) Find the solution using Production System
   b) What do you mean by knowledge representation? Represent the following facts using Semantic nets. 3+5

      a. Jack is a dog.
      b. Jack is owned by Madan.
      c. Jack is black in color.
      d. Dogs like meat.
      e. The dog sat on the chair.
      f. A dog is a mammal.
      g. A chair is furniture.

3. a) What is Heuristic search technique? Explain A* search algorithm with suitable example. 7
   b) Represent the following using first order logic. 8
      – Birendra likes easy courses.

      – Engineering courses are hard.
      – All courses in software department are easy.
      – AINN is software course.

   Also use resolution to answer the question, "What course Birendra likes?"
4. a) Differentiate between supervised and unsupervised learning. What do you mean by Explanation based learning (EBL)? 7
   b) 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
5. a) What are the differences between Biological Neural Networks (BNN) and Artificial Neural Networks (ANN)? Explain Hopfield Network. 8
   b) What do you mean by Multilayer Perceptron? Explain Back-propagation learning algorithm. 7
6. a) Why do we need expert systems? Draw and explain the architecture of an expert system. 7
   b) Explain the steps involve in NLP. Construct a parse tree for the sentence "*The bird pecks the grains*". 8
7. Write short notes on: **(Any two)** 2×5
   a) Turing Test
   b) Proposition vs Predicate Logic
   c) Bayesian Networks