Bihar Engineering University, Patna
End Semester Examination - 2022

Course: B.Tech. | *Semester: V* | *Time: 03 Hours*
Code: 105501 | *Subject: Artificial Intelligence* | *Full Marks: 70*

Instructions:-

(i) The marks are indicated in the right-hand margin.
*(ii) There are **NINE** questions in this paper.*
*(iii) Attempt **FIVE** questions in all.*
(iv) Question No. 1 is compulsory.

Q.1 ***Choose the correct answer of the following (Any seven question only):*** **[2 x 7 = 14]**

(a) In LISP, the function returns the list that result after the first element is removed (the rest of the list), is
(i) car (ii) last
(iii) cons (iv) cdr

(b) What is artificial intelligence?
(i) Putting your intelligence into computer
(ii) Programming with your own intelligence
(iii) Making a machine intelligent
(iv) Playing a game

(c) Which is the best way to go for game playing problem?
(i) Linear approach (ii) Heuristic approach (some knowledge is stored)
(iii) Random approach (iv) An optimal approach

(d) Face Recognition system is based on which type of approach?
(i) Weak AI approach
(ii) Applied AI approach
(iii) Cognitive AI approach
(iv) Strong AI approach

(e) Which is not the commonly used programming language for AI?
(i) Prolog
(ii) Java
(iii) LISP
(iv) Perl

(f) What are not represented by using propositional logic?
(i) Objects (ii) Relations
(iii) Both objects and relations (iv) None of the above

(g) Inference algorithm is completed only if
(i) it can derive any sentence
(ii) it can derive any sentence that is an entailed version
(iii) it is truth preserving
(iv) it can derive any sentence that is an entailed version and it is truth preserving

(h) Which search strategy is also called as blind search?
(i) Uniformed search (ii) Informed search
(iii) Simple reflex search (iv) All of the mentioned

(i) Which is used for utility functions in game playing algorithm?
(i) Linear polynomial (ii) Weighted polynomial
(iii) Polynomial (iv) Linear weighted polynomial

(j) Graph used to represent semantic network is
(i) undirected graph (ii) directed graph
(iii) directed acyclic graph (DAG) (iv) directed complete graph

P.T.O.

Q.2 (a) Define Artificial Intelligence (AI). Discuss the applications area of AI. [7]

(b) Explain AO* algorithm with an example. [7]

Q.3 (a) Explain with diagram the organization of a natural language understanding system. [7]

(b) Describe all the levels of language understanding in natural language processing system. [7]

Q.4 (a) What do you mean by learning? Explain briefly the learning methods. Discuss the advantages and disadvantages of rule-based system. [7]

(b) Explain the human preferences in encoding uncertainty during parsing. [7]

Q.5 (a) Explain hill climbing algorithm. Explain plateau, ridge, and local maxima. [7]

(b) Explain knowledge acquisition techniques. [7]

Q.6 (a) What is fuzzy set? What is the difference between fuzzy set and crisp set? Explain different fuzzy set operations using examples. [7]

(b) Write a Prolog program that verified whether an input list is a palindrome. [7]

Hint: Goal : Palindrome ([r, a, c, e, c, a, r])
Output : Yes
Goal : Palindrome ([a, b, c])
Output : No

Q.7 (a) Consider the Water Jug problem as stated here. "You are given two jugs, a 4-gallon one and a 3-gallon one. Neither has any measuring marker on it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2 gallons of water into the 4-gallon jug?" Represent this as a problem in State Space Search and state its Production Rules. Show at least one solution to this problem. [7]

(b) Explain the basic component of an expert system. [7]

Q.8 (a) Why is Natural Language Processing (NLP) used? Is NLP difficult to learn? Explain. [7]

(b) Write a function in LISP that computes prime number between 1 and 25 (inclusive). [7]

Q.9 (a) Describe logistic regression with suitable examples. [7]

(b) Define prior probability and conditional probability. State Bayes's theorem. How is it useful for decision making under uncertainty. [7]