

Bihar Engineering University, Patna
End Semester Examination - 2022

Course: B.Tech.
Code: 105501

Semester: V
Subject: Artificial Intelligence

Time: 03 Hours
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]



Parsing