

Seat No. : _____

NR-118

November-2017

4th Year M.Sc., (CA & IT) (Integrated)

Artificial Intelligence

Time : 3 Hours]

[Max. Marks : 100

1. (a) Explain the “Turing test”. Discuss its significance as a criteria for success of an intelligent machine. 7
(b) Mention three important AI Techniques. 3
(c) Define the following terms : 3
 - (i) State Space Search
 - (ii) Heuristic Search
 - (iii) Heuristic Function
- (d) Consider the Water Jug problem as stated here: “You are given two jugs, a 4-gallon one and a 3-gallon one. Neither have any measuring markers 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
2. (a) State the difference between Hill Climbing and Simulated Annealing. 3
(b) Write an algorithm for Steepest-Ascent Hill Climbing. Also state the difference between Hill Climbing and Steepest-Ascent Hill Climbing. 7
(c) State and explain Best-First Search with example. 10
3. (a) Explain the mappings between Facts and Relationships. 3
(b) Which properties should a good system for representation of knowledge in a particular domain should possess ? 4
(c) Define the following terms : 3
 - (i) Facts
 - (ii) PROLOG
 - (iii) Horn Clause
- (d) State characteristics of Expert Systems. 4
(e) Explain Forward Chaining vs. Backward Chaining. 6

4. (a) Translate following sentences into formulas in Predicate Logic : 10
- (i) Everything is bitter or sweet.
 - (ii) The members of the St. Bridge club are Joe, Sally, Bill and Ellen.
 - (iii) Joe is married to Sally.
 - (iv) Bill is Ellen's brother.
 - (v) The spouse of every married person in the club is also in the club.
 - (vi) The last meeting of the club was at Joe's house.
 - (vii) Steve only likes easy courses.
 - (viii) Science courses are hard.
 - (ix) All the courses in the basketweaving department are easy.
 - (x) BK301 is a basketweaving course.
- (b) Explain how to represent English sentences in the form of Instance and Isa Relationships in predicate logic with example. 10
5. (a) Define the following terms : 6
- (i) Partitioned Semantic Net
 - (ii) Horizon Effect
 - (iii) Waiting for Quiescence
 - (iv) Book Moves
 - (v) Secondary Search
 - (vi) Semantic Net
- (b) Explain Intersection Search in Semantic Net with example. 4
- (c) Explain Alpha-Beta cutoffs in MINIMAX Search Procedure. 6
- (d) How to represent non-binary predicates in semantic net ? 4
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