

Total No. of printed pages = 3

CSE 1818 OE 41

13/1/23

Roll No. of candidate

--	--	--	--	--	--	--	--	--	--

BINA CHOWDHURY CENTRAL LIBRARY
(GIMT & GIPS)
Azara, Hatkhowapara
Guwahati - 781017

2023

B.Tech. 8th Semester End-Term Examination

ARTIFICIAL INTELLIGENCE

(New Syllabus (W.e.f. 2017-18) & New Syllabus (W.e.f. 2018-19))

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No. 1 and any *four* from the rest.

1. Choose the correct option or fill the gap: (10 × 1 = 10)
- (i) In an informed search $g(n)$ denotes
- (a) Path cost from starting node to a node 'n'
 - (b) Path cost from the node to goal node
 - (c) The minimum path cost solution through 'n'
 - (d) None of these
- (ii) Which of the following is complete but not optimal
- (a) Depth first search
 - (b) Breath first search
 - (c) Uniform cost search
 - (d) None of these
- (iii) Iterative deepening is _____
- (a) Complete, but not optimal
 - (b) Optimal, but not complete
 - (c) Complete and optimal
 - (d) Neither complete, not optimal
- (iv) Agent = _____ + Program (fill the gap)
- (v) _____ is an example of dynamic environment (fill the gap)

[Turn over

- (vi) Time complexity of some search algorithms are
 Time: $O(b^d)$, $O(b^m)$, $O(b^{d+1})$, (fill the gap)
 Time complexity of Depth first search is: _____
- (vii) _____ is an example of memory bounded heuristic.
- RBFS
 - MA*
 - Both (a) and (b)
 - None of these
- (viii) The capabilities required by a computer to pass Turing test is
- Machine learning
 - Automated reasoning
 - Only (a) is sufficient
 - Both (a) and (b) are required
- (ix) Which of the following is not a component of a problem?
- Initial state
 - Successor function
 - Goal test
 - Determine start state
- (x) For given statement $\forall x \exists y \text{ loves } (x, y)$, Which of the following is logically true.
- There is someone who is loved by everyone
 - Everybody loves somebody
 - Someone will be loved by everybody.
 - Every one will be loved by somebody.
2. (a) What is search space? Discuss a problem to demonstrate search space (e.g. water jug problem) (3 + 7 = 10)
- (b) Differentiate forward and backward reasoning. (5)
3. Discuss the following in brief with example. (5 × 3 = 15)
- Genome
 - Mutation
 - Cross over
 - Population
 - Chromosome

BINA CHOWDHURY CENTRAL LIBRARY
 (GIMT & GIPS)
 Azara, Hatkhowapara
 Guwahati - 781017

4. (a) Apply A* algorithm to solve 8-puzzle problem. (10)
 (b) What is the major demerit of A*? How this shortcoming is addressed. (5)
5. (a) What is a game tree? create a game tree for any two players game. (3+6)
 (b) Apply min-max procedure in this tree. (6)
6. (a) Show the importance of constraint satisfaction problem (CSP). Apply CSP to solve the following. (5+6=11)
 (b) What is mean-end-analysis? (4)
7. Bill is a white cat. Itot wild has a tail and four legs. Bills eat meat. Brown is a buffalo and it has a tail and four legs. Brown eats grass. Brown's color is white. Cat and buffalo can be either domestic or wild. Penny is a donkey and it consumes grass, penny is domestic. Convert these statements to FOL and Prove (or disprove) the following. (7 + 8 = 15)
- (a) Penny has a tail and four legs
 (b) Penny's color is not white
 (c) Penny does not eat meat
 (d) Penny is not wild
8. Write short notes on the following. (5 × 3 = 15)
- (a) Modus ponens and Modus tollens
 (b) Bay's Theorem
 (c) Issues in Hill climbing
 (d) Scripts
 (e) Semantic net

MINA CHOWDHURY CENTRAL LIBRARY
 (GIMT & GIPS)
 Azara, Hatkhowapara
 Guwahati - 781017