

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA – SEMESTER – 5 • EXAMINATION – SUMMER 2018****Subject Code: 3650002****Date: 02-May-2018****Subject Name: Artificial Intelligence (AI)****Time: 10.30 am to 1.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a) (1)** Explain “effective branching factor” (EBF) w.r.t. Heuristic function. **03**
Discuss the following cases.
(i) if $EBF < 1$ (ii) if $EBF = 1$ and (iii) if $EBF > 1$.
- (2)** Calculate Internal Nodes (I) for search tree if branching factor $b=10$ and **03**
depth $d = 3$.
- (3)** Explain the Polysemy with respect to Natural Language Processing. **01**
- (b) (1)** What is artificial Intelligence? How it is different than general intelligence **04**
(2) Write any three differences between BFS and DFS. **03**
- Q.2 (a) (1)** Differentiate: Iterative Hill Climbing (IHC) Vs Simulated Annealing **03**
Techniques.
- (2)** State True or False with reason (No reason No marks): “ For a same **02**
surface Hill Climbing (HC) algorithm will always return the same result
while the IHC algorithm may return different result”.
- (3)** Explain Ordering link and Casual Link w.r.t. Plan Space Planning. **02**
- (b)** Explain Branch & Bound algorithm with an example. **07**
- OR**
- (b)** Explain Naive Bayes Classifiers. Explain Text classification with **07**
example.
- Q.3 (a)** Explain Plan space planning. How threat has been (i) materialized in plan **07**
space planning and (ii) eliminated through Separation, Promotion and
Demotion method? Explain with an example.
- (b)** Explain Recursive Best First Search. How Lowest f-value are backed up at **07**
each level? Explain.
- OR**
- Q.3 (a)** Explain Travelling Sales man problem through A* Algorithm. Consider and **07**
draw a weighted, directed graph from Source ‘S’ to Goal ‘G’ having
multiple paths to travel from ‘S’ to ‘G’ as per your choice, and apply A*
algorithm to find the best route. Show all the steps of calculations.
- (b)** Explain Forward State Space planning. Discuss its pros and cons. **07**
- Q.4 (a)** 1. Explain Backward State Space planning with an example. **05**
2. Differentiate BSSP Vs Goal Stack Planning **02**
- (b)** Describe alpha-beta algorithm for game playing with example. Show how **07**
it is better than Mini-Max algorithm?
- OR**
- Q.4 (a)** What is the role of agent in knowledge representation? Explain declarative **07**
knowledge.

- (b) Write short note (ANY TWO) : 07
1. Ant Colony Algorithm
 2. Genetic Algorithm
 3. Neural Network
- Q.5** (a) Explain the usage of hypernymy tree by WordNet for the following 07
WordNet hierarchy.
Entity→ organism→person→bad person→Wrongdoer→deceiver→fox
Calculate (1) Distance_{ROOT} (2) Distance_{LCS} and
(3) Similarity ('fox', 'wrongdoer').
- (b) Explain Mini-Max algorithm for game playing with example. 07
- OR**
- Q.5** (a) Write the name of any four NLP techniques. Explain Lexical semantics and 07
parsing with example
- (b) What is planning? Explain STRIPS operator and its components for block 07
word problem.
