

7th Semester B.E FASTTRACK Examination, OCTOBER_NOVEMBER_2020**DATA SCIENCE**

Time: 3 hrs

Max. Marks :100

Instructions :1. Answer any Five full Questions selecting at least One Full Question from Each Unit. 2. Each Question carry Equal Marks. 3. Missing Data may be suitably assumed.

MODULE 1

L CO PO M

1a.What is data science? Summarize the similarities and differences in big data and data science [2] [1] [2] [10]

1b. Illustrate the Discovery phase and Data preparation phase of data science life cycle with a neat diagram. [2] [1] [1] [10]

OR

2a. Write a brief note on history of data science. Illustrate how data science is used in different fields [3] [1] [1] [10]

2b. Define datafication. Bring out the differences between a data analyst and data scientist. [2] [1] [2] [10]

MODULE 2

3a. Illustrate the data science process with a neat diagram [2] [1] [1] [10]

3b. What is a model? Explain how modeling is done using exploratory data analysis. [2] [2] [2] [10]

OR

4a. Write a note on

- 1. Population
- 2. Sample
- 3. Parameter
- 4. Estimate of parameter

[2] [2] [1] [10]

4b. What is hypothesis testing? Explain any three hypothesis test methods [2] [2] [1] [10]

MODULE 3

5a. What is machine learning? Explain the classification of machine learning algorithms. [2] [1] [1] [10]

5b. Demonstrate the use of linear regression for predicting house price with suitable snippets. [3] [3] [4] [10]

OR

6a. Briefly explain the K Nearest Neighbour algorithm. List out the modeling assumptions to be made while using KNN algorithm [3] [2] [4] [10]

6b Demonstrate how least squares method is used to best fit the linear regression algorithm [2] [2] [3] [10]

MODULE 4

7a Write a brief note on:

1. Newton's method for maximum likelihood
2. Stochastic Gradient Descent

[2] [2] [3] [10]

7b. Contrast between Naïve Bayes and KNN algorithm in classification of messages [2] [3] [1] [10]

OR

8a. Demonstrate how classification of spam messages is performed using Naïve Bayes algorithm [2] [2] [3] [10]

8b Illustrate the use of Logistic regression for classification [2] [3] [2] [10]

MODULE 5

9a. Write a note on

1. Hadoop
2. Cloudera

[2] [3] [1] [10]

9b. Explain map reduce considering word frequency problem as an example [2] [3] [1] [10]

10a. List and explain the drawbacks of hadoop [2] [3] [1] [10]

10b. Illustrate how modeling is done in data engineering. [2] [3] [3] [10]

USN : _____

Course Code :16IS73

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[2] [3] [1] [10]

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Seventh Semester B.E. Makeup Examination, January 2020
DATA SCIENCE

Time: 3 Hours

Max. Marks: 100

- Instructions:** 1. Non-programmable calculators are allowed
 2. Answer any one full question from each unit.

1. a. Explain the different sources of Big Data deluge. L CO PO M
 b. Define Data Science. Explain its goal. Give any two real life examples for applications of data science. (2) (1) (1) (06)
 c. List the different steps of data science life cycle. Briefly explain each one of them. (2) (1) (1) (06)
(2) (1) (1) (08)

- OR**
 a. Briefly explain the classification of big data with examples. (2) (1) (1) (07)
 b. What is Datafication? Explain it with any two examples. (2) (1) (1) (06)
 c. Define Data Scientist? Illustrate the five main sets of skill sets of Data Scientist. (2) (1) (1) (07)

2. a. Explain the importance of exploratory data analysis in data science. L CO PO M
 b. Define the terms Populations and Samples. Explain the two with examples. (2) (1) (5) (06)
 c. What is the meaning of model? Explain the statistical model. How do you build a model? (2) (1) (5) (06)
(2) (1) (5) (08)

3. a. Explain the different methods of Sampling. (2) (1) (5) (06)
 b. Define the term Inference. Illustrate the different types of Inferential Statistics. (2) (1) (5) (06)
 c. Explain the steps in Data Science process with the help of a block diagram. (2) (1) (5) (08)

UNIT - III L CO PO M

4. a. Demonstrate the use of linear regression for predicting house price with suitable snippets. (3) (3) (4) (10)
 b. Illustrate K Nearest Neighbor (KNN) algorithm with an example. List the modeling assumptions considered while using KNN (3) (3) (4) (10)

OR

5. a. Illustrate the importance of least squared methods in fitting the model (2) (3) (2) (08)
 b. Write a note on K means clustering algorithm. (2) (3) (1) (08)
 c. What is Machine learning? Explain the classification of machine learning algorithms (2) (3) (1) (04)

UNIT - IV

- 7 a. Why linear regression cannot be used for spam filtering? (1) (2) (2) (06)
- b. Analyze the following raw dataset with y as response and x_1 & x_2 as predictor variables to estimate the three coefficients, β_0 , β_1 and β_2 , using logistic regression. (4) (2) (4) (08)
- | x_1 | x_2 | y |
|-------------|---------------|-----|
| 2.7810836 | 2.550537003 | 0 |
| 1.465489372 | 2.362125076 | 0 |
| 3.396561688 | 4.400293529 | 0 |
| 1.38807019 | 1.850220317 | 0 |
| 3.06407232 | 3.005305973 | 0 |
| 7.627531214 | 2.759262235 | 1 |
| 5.332441248 | 2.088626775 | 1 |
| 6.922596716 | 1.77106367 | 1 |
| 8.675418651 | -0.2420686549 | 1 |
| 7.673756466 | 3.508563011 | 1 |
- c. Compare and contrast Logistic and Linear regression algorithms (2) (3) (1) (06)

OR

- a. Explain the Bayes Law with meaning of terms used. (2) (1) (1) (06)
- b. Explain the spam classification using Naïve Bayes technique. (2) (3) (4) (08)
- c. Apply Bayes law to find the probability that the patient is actually infected? Given that 1% of the population is infected. A highly sensitive and specific medical test shows 99% of sick patients test positive and 99% of healthy patients test negative. (3) (1) (2) (06)

UNIT - V

- a. Explain the MapReduce technique with a suitable example (2) (1) (5) (10)
- b. Explain the term Hadoop and how to get started with Hadoop. (2) (1) (5) (10)
- OR**
- a. Explain Word frequency problem in detail. (2) (1) (2) (10)
- b. Explain what MapReduce can do? And what it can't. (2) (1) (5) (10)

Seventh Semester B.E. Makeup Examination, January 2020

DATA SCIENCE

Max. Marks: 100

Time: 3 Hours

Instructions:

1. Non-programmable calculators are allowed.
2. Answer any one full question from each unit.

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UNIT - I

1. a. Explain the different sources of Big Data deluge. (2) (1) (1) (06)
- b. Define Data Science. Explain its goal. Give any two real life examples for applications of data science. (2) (1) (1) (06)
- c. List the different steps of data science life cycle. Briefly explain each one of them. (2) (1) (1) (08)

OR

- a. Briefly explain the classification of big data with examples. (2) (1) (1) (07)
- b. What is Datafication? Explain it with any two examples. (2) (1) (1) (06)
- c. Define Data Scientist? Illustrate the five main sets of skill sets of Data Scientist. (2) (1) (1) (07)

UNIT - II

3. a. Explain the importance of exploratory data analysis in data science. (2) (1) (5) (06)
- b. Define the terms Populations and Samples. Explain the two with examples. (2) (1) (5) (06)
- c. What is the meaning of model? Explain the statistical model. How do you build a model? (2) (1) (5) (08)

OR

4. a. Explain the different methods of Sampling. (2) (1) (5) (06)
- b. Define the term Inference. Illustrate the different types of Inferential Statistics. (2) (1) (5) (06)
- c. Explain the steps in Data Science process with the help of a block diagram. (2) (1) (5) (08)

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- b. Write a note on K means clustering algorithm. (2) (3) (1) (08)
- c. What is Machine learning? Explain the classification of machine learning algorithms (2) (3) (1) (04)

UNIT - IV

7 a. Why linear regression cannot be used for spam filtering?

L CO PO M

b. Analyze the following raw dataset with y as response and x_1 & x_2 as predictor variables to estimate the three coefficients, β_0 , β_1 and β_2 , using logistic regression.

(1) (2) (2) (06)

x_1	x_2	y
2.7810836	2.550537003	0
1.465489372	2.362125076	0
3.396561688	4.400293529	0
1.38807019	1.850220317	0
3.06407232	3.005305973	0
7.627531214	2.759262235	1
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6.922596716	1.77106367	1
8.675418651	-0.2420686549	1
7.673756466	3.508563011	1

c. Compare and contrast Logistic and Linear regression algorithms

(4) (2) (4) (08)

(2) (3) (1) (06)

OR

8 a. Explain the Bayes Law with meaning of terms used.

(2) (1) (1) (06)

b. Explain the spam classification using Naïve Bayes technique.

(2) (3) (4) (08)

c. Apply Bayes law to find the probability that the patient is actually infected? Given that 1% of the population is infected. A highly sensitive and specific medical test shows 99% of sick patients test positive and 99% of healthy patients test negative.

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L CO PO M

UNIT - V

9 a. Explain the MapReduce technique with a suitable example

(2) (1) (5) (10)

b. Explain the term Hadoop and how to get started with Hadoop.

(2) (1) (5) (10)

OR

10 a. Explain Word frequency problem in detail.

(2) (1) (2) (10)

b. Explain what MapReduce can do? And what it can't.

(2) (1) (5) (10)

Seventh Semester B.E. Makeup Examination, January 2020
ARTIFICIAL INTELLIGENCE

Time: 3 Hours

Max. Marks: 100

- Instructions:*
1. Precise and accurate answers expected.
 2. Data, if necessary, may be assumed.
 3. Sketches, when required, may be drawn.

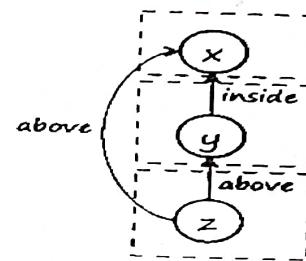
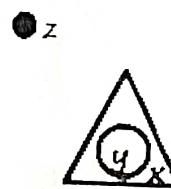
UNIT - I

L CO PO M

1. a. Define (i) Intelligence (ii) Artificial intelligence (iii) Strong Methods and Weak Methods
 And discuss the Chinese Room Experiment in detail.

(1) (1) (1) (12)

- c. Design Semantic net with appropriate frames for the following objects having relations to each other:

(3) (3) (2) (08)
L CO PO M**OR**

2. a. Construct a simple semantic net, for the following: Bob as builder, Fido as dog, and Fang as cat and Mice. Also represent the same using Frames demonstrating the inheritance.
 (3) (3) (2) (10)
- b. Explain the properties of Semantic tree. Define the search tree. Build the search tree for the given problem.

Three missionaries and three cannibals are on one side of a river, with a canoe. They all want to get to the other side of the river. The canoe can only hold one or two people at a time. At no time should there be more cannibals than missionaries on either side of the river, as this would probably result in the missionaries being eaten.

(3) (3) (2) (10)
L CO PO M**UNIT - II**

- a. Explain DFS and BFS in brief. Also explain the properties of search methods. Build a search tree for Searching for a Gift.
 (3) (1) (1) (10)
- b. Write the pseudo code for implementing of depth-first search. And analyze the given tree in Fig.1 using DFS.

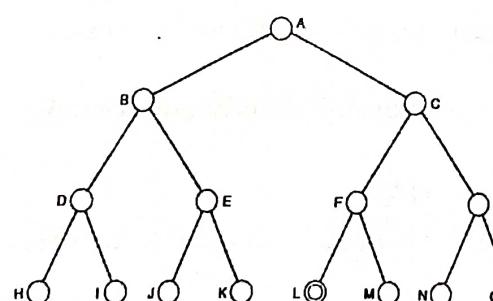


Fig.1. Tree

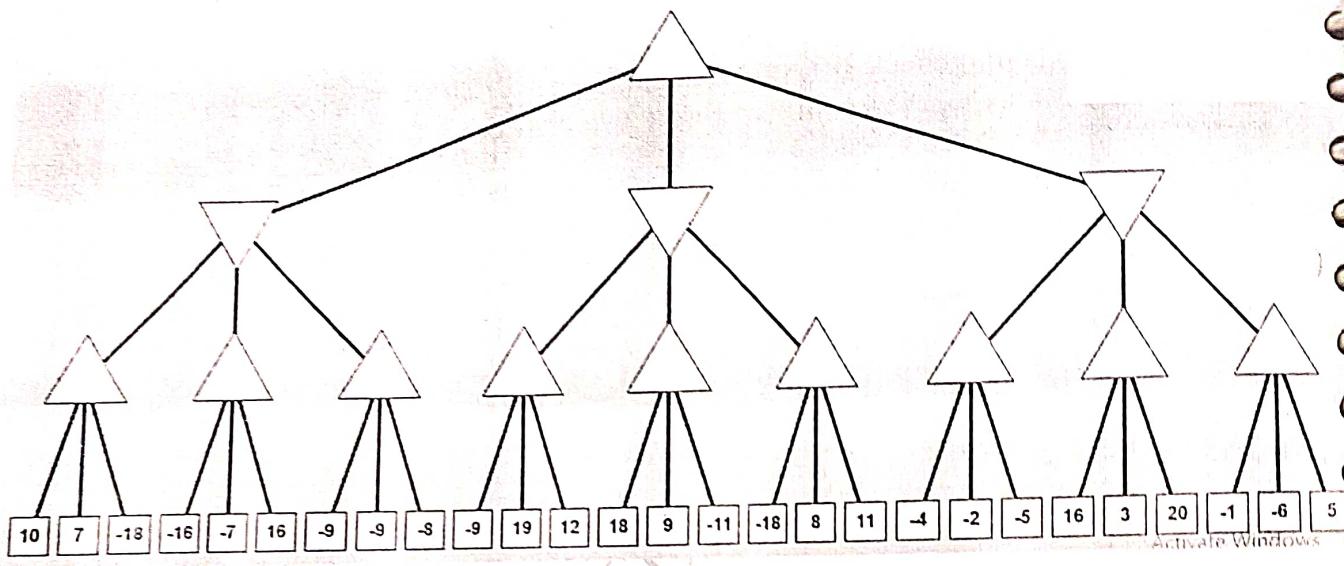
(3) (1) (1) (10)

OR

- 4 a. List and explain the Properties of Search Methods. (2) (1) (1) (08)
 b. Develop the various heuristics approaches for 8-puzzle. The puzzle consists of a 3 X 3 grids, with the numbers 1 through 8 on tiles within the grid and one blank square. Tiles can be slid about within the grid, but a tile can only be moved into the empty square if it is adjacent to the empty square. (3) (2) (2) (12)
 L CO PO M

UNIT - III

- 5 a. Apply and analyze alpha beta pruning algorithm on the given graph



- b. Explain deduction theorem with example. Explain the relationship between universal and existential quantifiers. (2) (3) (2) (10)

OR

- 6 a. Explain with relevant examples why the alpha-beta procedure will always generate the same answer as Minimax without pruning. Why is it useful? (2) (3) (2) (10)

- b. Prove the following

$$\begin{aligned} \text{i)} \quad & (A \rightarrow B) \rightarrow ((B \rightarrow C) \rightarrow ((C \rightarrow D) \rightarrow (A \rightarrow D))) \\ \text{ii)} \quad & (\neg A \rightarrow B) \rightarrow (\neg B \rightarrow A) \end{aligned}$$

(3) (3) (2) (10)
 L CO PO M

UNIT - IV

- 7 a. Solve the phrase to get Conjunctive Normal Form (CNF): $(A \rightarrow B) \rightarrow C$ (3) (2) (2) (06)
 b. Explain the Resolution Rule and using the Resolution Rule resolve $\{A, B\}, \{\neg B, C\}$ (2) (1) (1) (06)
 c. With block diagram, explain the architecture of an Expert System. (2) (1) (1) (08)

OR

- 8 a. Solve the phrase to get Conjunctive Normal Form (CNF): $A \leftrightarrow (B \wedge C)$ (3) (2) (1) (06)
 b. Illustrate "Proof by Reputation" using an example. (2) (2) (1) (06)
 c. Explain how to build a medical expert system using backward chaining in Rule-Based Expert System (2) (2) (1) (08)

UNIT - V

L CO PO M

- a. Using block schematic, discuss why the blackboard architecture is an effective way to combine information from a number of knowledge sources. Also explain the main components of the blackboard architecture. (2) (1) (1) (10)

- b. Using block schematic, explain various kinds of problems the Copycat Architecture can solve. (2) (1) (1) (10)

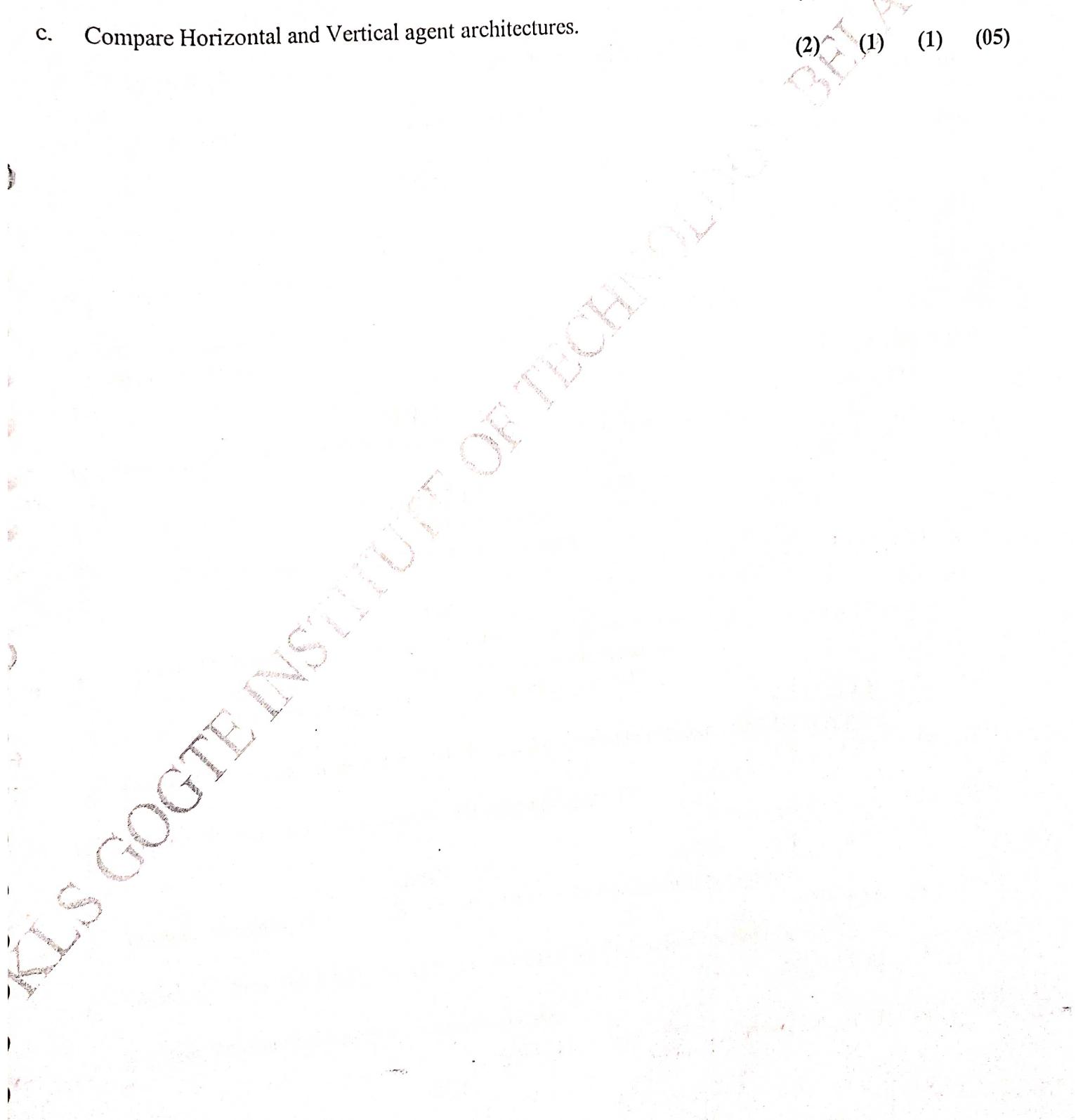
OR

L CO PO M

- a. Define an agent? List and explain five properties of agents. Explain briefly five types of agents. (2) (1) (1) (10)

- b. Explain with block diagram three-layer subsumption architecture for an agent. (2) (1) (1) (05)

- c. Compare Horizontal and Vertical agent architectures. (2) (1) (1) (05)



Seventh Semester B.E. Makeup Examination, January 2020
ARTIFICIAL INTELLIGENCE

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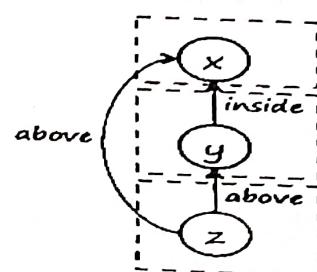
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UNIT - I

L CO PO M

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- c. Design Semantic net with appropriate frames for the following objects having relations to each other:

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UNIT - II

L CO PO M

(3) (3) (2) (10)

- a. Explain DFS and BFS in brief. Also explain the properties of search methods. Build a search tree for Searching for a Gift.

(3) (1) (1) (10)

- b. Write the pseudo code for implementing of depth-first search. And analyze the given tree in Fig.1 using DFS.

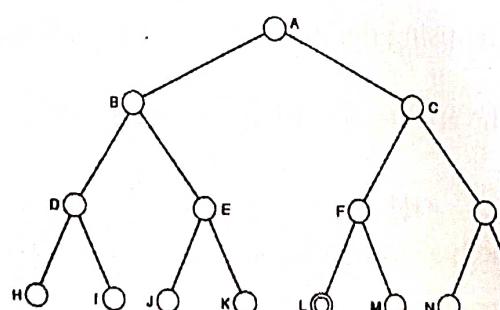


Fig.1. Tree

(3) (1) (1) (10)

OR

4 a. List and explain the Properties of Search Methods.

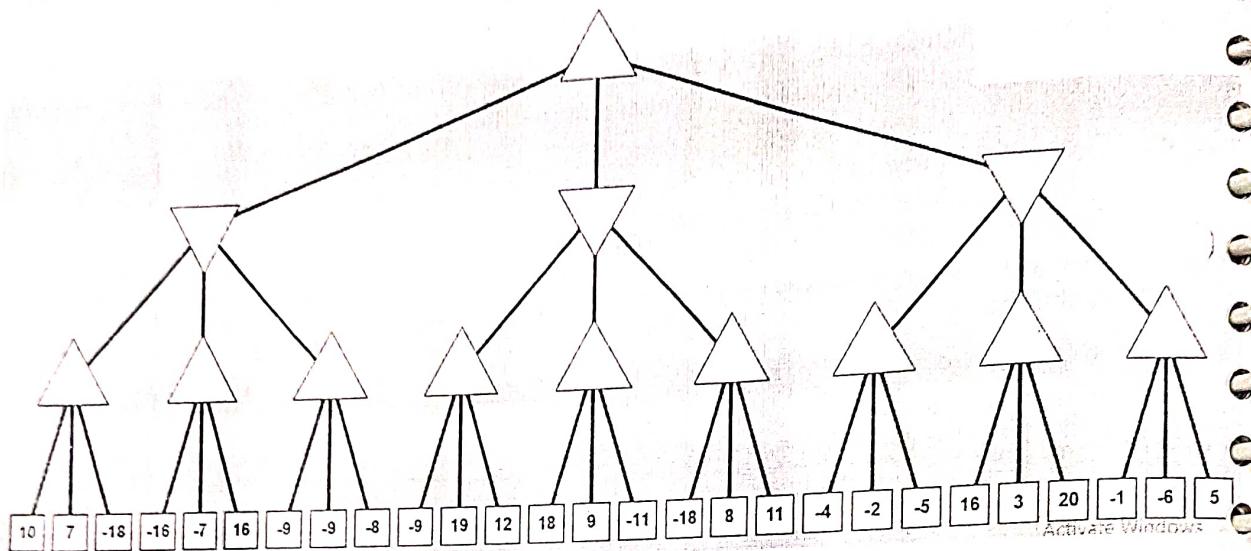
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b. Develop the various heuristics approaches for 8-puzzle. The puzzle consists of a 3 X 3 grids, with the numbers 1 through 8 on tiles within the grid and one blank square. Tiles can be slid about within the grid, but a tile can only be moved into the empty square if it is adjacent to the empty square.

(3) (2) (2) (12)
L CO PO M

UNIT - III

5 a. Apply and analyze alpha beta pruning algorithm on the given graph



(4) (2) (1) (10)

b. Explain deduction theorem with example. Explain the relationship between universal and existential quantifiers.

(2) (3) (2) (10)

OR

6 a. Explain with relevant examples why the alpha-beta procedure will always generate the same answer as Minimax without pruning. Why is it useful?

(2) (3) (2) (10)

b. Prove the following

- i) $(A \rightarrow B) \rightarrow ((B \rightarrow C) \rightarrow ((C \rightarrow D) \rightarrow (A \rightarrow D)))$
- ii) $(\neg A \rightarrow B) \rightarrow (\neg B \rightarrow A)$

(3) (3) (2) (10)
L CO PO M

UNIT - IV

7 a. Solve the phrase to get Conjunctive Normal Form (CNF): $(A \rightarrow B) \rightarrow C$

(3) (2) (2) (06)

b. Explain the Resolution Rule and using the Resolution Rule resolve $\{A, B\}, (\neg B, C)$

(2) (1) (1) (06)

c. With block diagram, explain the architecture of an Expert System.

(2) (1) (1) (08)

OR

8 a. Solve the phrase to get Conjunctive Normal Form (CNF): $A \leftrightarrow (B \wedge C)$

(2) (1) (1) (08)
L CO PO M

b. Illustrate "Proof by Reputation" using an example.

(3) (2) (1) (06)

c. Explain how to build a medical expert system using backward chaining in Rule-Based Expert System.

(2) (2) (1) (08)

UNIT - V

L CO PO M

- a. Using block schematic, discuss why the blackboard architecture is an effective way to combine information from a number of knowledge sources. Also explain the main components of the blackboard architecture.

- b. Using block schematic, explain various kinds of problems the Copycat Architecture can solve.

(2) (1) (1) (10)

OR

L CO PO M

- a. Define an agent? List and explain five properties of agents. Explain briefly five types of agents.

(2) (1) (1) (10)

- b. Explain with block diagram three-layer subsumption architecture for an agent.

(2) (1) (1) (05)

- c. Compare Horizontal and Vertical agent architectures.

(2) (1) (1) (05)

Seventh Semester B.E. Semester End Examination, Dec./Jan. 2019-20**DATA SCIENCE**

Time: 3 Hours

Max. Marks: 100

Instructions: 1. Answer any one full question from each unit.
 2. Use diagrams and examples wherever necessary.

UNIT - I

L CO PO M

- 1 a. What is data science? Summarize the similarities and differences in big data and data science
 (2) (1) (1) (10)
- b. Illustrate the Discovery phase and Data preparation phase of data science life cycle with a neat diagram.
 (2) (1) (1) (10)

OR

- 2 a. What is datafication? Write a note on the applications of data science in different fields of applications
 (2) (1) (1) (08)
- b. List and explain the different challenges that arise in processing big data.
 (2) (1) (4) (04)
- c. Write a brief note on
 (a) Current landscape of data science.
 (b) Skill set required for a data scientist
 (2) (1) (1) (08)

UNIT - II

L CO PO M

- 3 a. Illustrate the data science process with a neat diagram
 (2) (1) (1) (10)
- b. What is a model? Explain the process of modeling using exploratory data analysis
 (2) (2) (2) (10)

OR

- 4 a. Explain the following terms
 (a) Population
 (b) Sample
 (c) Parameter
 (d) Estimate of parameter
 (e) Probability distributions
 (2) (2) (1) (10)
- b. What is hypothesis testing? Explain any three hypothesis test methods
 (2) (2) (1) (10)

UNIT - III

L CO PO M

- 5 a. What is Linear Regression? Briefly explain any two applications of Linear Regression.
 (2) (3) (2) (06)
- b. Analyze the following raw dataset with y as response and x as predictor variables to estimate the two coefficients, β_0 and β_1 , using linear regression. Dataset $x: 1, 2, 3, 4, 5, 6$ $y: 1, 3, 3, 2, 5$
 (4) (2) (4) (08)
- c. Distinguish K-means from KNN machine learning algorithm.
 (2) (3) (2) (06)

OR

- 6 a. Explain the various Similarity or Distance metric that are used in KNN algorithm

(2) (3) (2) (06)

b. Explain the Evaluation metrics used and their interpretation for evaluating the model. (2) (2) (2) (08)

c. Explain the various steps involved in K means algorithm. (2) (3) (1) (06)
L CO PO M

UNIT - IV

7 a. Demonstrate the use of naive bayes classifier to classify the messages as spam or ham. (3) (3) (2) (10)

b. Write a brief note on:
(i) Newton's method for maximum likelihood
(ii) Stochastic Gradient Descent (2) (3) (1) (10)

OR

8 a. Illustrate the use of Logistic regression for classification. (2) (3) (2) (10)

b. Contrast between the use of Naïve bayes and KNN for classification of the texts. (2) (3) (2) (10)
L CO PO M

UNIT - V

9 a. What is map reduce? Illustrate the use of map reduce in word frequency count problem. (3) (2) (1) (08)

b. Explain handling of data abundance and data scarcity in data engineering. (2) (2) (1) (06)

c. Explain how modeling is done in data engineering. (2) (2) (5) (06)

OR

10 a. Write a note on
(a) Hadoop
(b) Cloudera (2) (2) (1) (10)

b. Explain map reduce with an example. (3) (2) (1) (10)

Seventh Semester B.E. Semester End Examination, Dec./Jan. 2019-20**ARTIFICIAL INTELLIGENCE**

Time: 3 Hours

Max. Marks: 100

*Instructions: 1. Answer one full question each from the Units***UNIT - I**

L CO PO M

- 1 a. Explain Turing test and Chinese room argument experiment. Compare and contrast.
(2) (3) (2) (10)

- b. Convert the following information into semantic nets and frames:

Tom is a cat. Tom caught a bird. Tom is owned by John. Tom is ginger in color. Cats like cream. The cat sat on the mat. A cat is a mammal. A bird is an animal. All mammals are animals. Mammals have fur.

(3) (2) (2) (10)
OR

- 2 a. Explain the relationship between graphs, semantic nets, semantic trees, search spaces, and search trees.
(2) (3) (2) (10)

- b. Design a suitable representation and draw the complete search tree for the following problem.

A farmer is on one side of a river and wishes to cross the river with a wolf, a chicken, and a bag of grain. He can take only one item at a time in his boat with him. He can't leave the chicken alone with the grain, or it will eat the grain, and he can't leave the wolf alone with the chicken, or the wolf will eat the chicken. How does he get all three safely across to the other side?

(5) (3) (2) (10)
UNIT - II

L CO PO M

- 3 a. Explain how you implement Depth First Search and Breadth First Search with example code. Compare both search techniques.
(2) (3) (2) (10)

- b. Explain with example how you use heuristics for search. Explain the criteria for selecting a good heuristic.
(2) (3) (2) (10)

OR

- 4 a. Explain different techniques to identify optimal paths.
(2) (3) (2) (10)

- b. Implement a greedy-search algorithm. How well does it perform compared with the other methods you have implemented? Invent a 0-1 knapsack problem, and use your search tree implementation to model this problem. Can you model the fractional knapsack problem using a search tree?
(5) (2) (1) (10)

UNIT - III

L CO PO M

- 5 a. Explain the following terms (i) Game Trees (ii) Minimax (ii) Alpha beta pruning.
(2) (2) (3) (12)

- b. What is Logic? Explain Why Logic is used in Artificial Intelligence and explain Logical Operators.
(2) (2) (3) (08)

OR

- 6 a. Explain the concepts of Translating between English and Logic Notation and explain the following Truth Tables of Not, And, Or, Implies, if, Complex Truth Tables.
(2) (3) (2) (12)

- b. Explain deduction Theorem with an example.
(2) (4) (4) (08)

UNIT - IV

7 a. Consider the following axioms and convert them to clausal form

- a) Every coyote chases some roadrunner.
- b) Every roadrunner who says "beep-beep" is smart.
- c) No coyote catches any smart roadrunner.
- d) Any coyote who chases some roadrunner but does not catch it is frustrated.
- e) (Conclusion) If all roadrunners say "beep-beep", then all coyotes are frustrated.

Prove the conclusion If all roadrunners say "beep-beep", then all coyotes are frustrated

(3) (3) (2) (10)

b. Explain with examples resolution in propositional logic.

(2) (3) (2) (10)

OR

8 a. Explain with examples resolution in predicate logic.

(2) (3) (2) (10)

b. Explain with example backward chaining.

(2) (3) (2) (10)

UNIT - V

L CO PO M

9 a. Explain black board architecture with its implementation.

(2) (3) (2) (10)

b. Explain with example Dempster-Shafer theory of evidence.

(2) (3) (2) (10)

OR

10 a. List and explain properties of agents.

(2) (1) (2) (10)

b. List and explain types of agents.

(2) (1) (2) (10)

Seventh Semester B.E. Semester End Examination, Dec./Jan. 2019-20

Time: 3 Hours

DATA SCIENCE

Max. Marks: 100

- Instructions:**
1. Answer any one full question from each unit.
 2. Use diagrams and examples wherever necessary.

UNIT - I

1. a. What is data science? Summarize the similarities and differences in big data and data science
L CO PO M
(2) (1) (1) (10)
- b. Illustrate the Discovery phase and Data preparation phase of data science life cycle with a neat diagram.
(2) (1) (1) (10)

OR

2. a. What is datafication? Write a note on the applications of data science in different fields of applications
(2) (1) (1) (08)
- b. List and explain the different challenges that arise in processing big data.
(2) (1) (4) (04)
- c. Write a brief note on
 - (a) Current landscape of data science.
 - (b) Skill set required for a data scientist(2) (1) (1) (08)
L CO PO M

UNIT - II

3. a. Illustrate the data science process with a neat diagram
(2) (1) (1) (10)
- b. What is a model? Explain the process of modeling using exploratory data analysis
(2) (2) (2) (10)

OR

4. a. Explain the following terms
 - (a) Population
 - (b) Sample
 - (c) Parameter
 - (d) Estimate of parameter
 - (e) Probability distributions(2) (2) (1) (10)
- b. What is hypothesis testing? Explain any three hypothesis test methods
(2) (2) (1) (10)
L CO PO M

UNIT - III

5. a. What is Linear Regression? Briefly explain any two applications of Linear Regression.
(2) (3) (2) (06)
- b. Analyze the following raw dataset with y as response and x as predictor variables to estimate the two coefficients, β_0 and β_1 , using linear regression. Dataset $x: 1, 2, 3, 4, 5, 6$ $y: 1, 3, 3, 2, 5$
(4) (2) (4) (08)
- c. Distinguish K-means from KNN machine learning algorithm.
(2) (3) (2) (06)

OR

6. a. Explain the various Similarity or Distance metric that are used in KNN algorithm
(2) (3) (2) (06)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)

b. Explain the Evaluation metrics used and their interpretation for evaluating the model. (2) (2) (2) (08)

c. Explain the various steps involved in K means algorithm. (2) (3) (1) (06)

UNIT - IV

7 a. Demonstrate the use of naive bayes classifier to classify the messages as spam or ham. (3) (3) (2) (10)

b. Write a brief note on:

- (i) Newton's method for maximum likelihood
- (ii) Stochastic Gradient Descent

8 a. Illustrate the use of Logistic regression for classification. (2) (3) (1) (10)

b. Contrast between the use of Naïve bayes and KNN for classification of the texts. (2) (3) (2) (10)

UNIT - V

9 a. What is map reduce? Illustrate the use of map reduce in word frequency count problem. (2) (3) (2) (10)

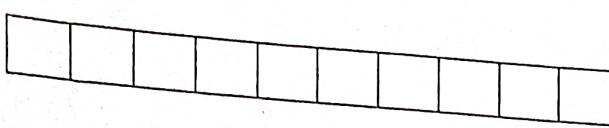
b. Explain handling of data abundance and data scarcity in data engineering. (3) (2) (1) (08)

c. Explain how modeling is done in data engineering. (2) (2) (1) (06)

OR

10 a. Write a note on
(a) Hadoop
(b) Cloudera (2) (2) (5) (06)

b. Explain map reduce with an example. (2) (2) (1) (10)
(3) (2) (1) (10)



Seventh Semester B.E. Makeup Examination, January 2019
DATA SCIENCE

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. Unit I and unit II are compulsory
 2. Answer anyone full question from remaining units

- | | | | | | | |
|---|---|-------------------|----------|-----------|-----------|-----------|
| 1 | a. What is data science? Illustrate the relationship between big data and data science. | UNIT - I | L
(2) | CO
(1) | PO
(2) | M
(08) |
| | b. Define datafication. Bring out the differences between a data analyst and data scientist. | | (2) | (1) | (2) | (08) |
| | c. List and explain the different challenges that arise in processing big data. | | (2) | (1) | (4) | (04) |
| 2 | a. What is a model? Explain how modeling is done using exploratory data analysis. | UNIT - II | (2) | (2) | (2) | (10) |
| | b. Illustrate the process of data science with a diagram | | (2) | (2) | (1) | (10) |
| | | UNIT - III | | | | |
| 3 | a. What is machine learning? Explain the machine learning algorithms. | | (2) | (1) | (1) | (10) |
| | b. Compare between Supervised and Unsupervised machine learning. | | (3) | (2) | (4) | (10) |
| 4 | a. Briefly explain the K Nearest Neighbour algorithm. List out the modeling assumptions to be made while using KNN algorithm. | OR | (2) | (2) | (4) | (10) |
| | b. Explain the logistic regression model | | (2) | (2) | (2) | (10) |
| | | UNIT - IV | | | | |
| 5 | a. Explain classifiers, run-time, interoperability with respect to logistic regression | | (2) | (2) | (1) | (10) |
| | b. Write a brief note on: | | (2) | (2) | (1) | (10) |
| | (i) Newton's method for maximum likelihood | | | | | |
| | (ii) Stochastic Gradient Descent | | | | | |
| | | OR | | | | |
| 6 | a. Demonstrate how classification of spam messages is performed using Naïve Bayes algorithm | | (3) | (3) | (2) | (10) |
| | b. Explain why KNN and Linear regression algorithms cannot be used for filtering spam | | (2) | (2) | (2) | (10) |
| | | UNIT - V | | | | |
| 7 | a. Explain MapReduce and its framework with an example | | (2) | (2) | (1) | (10) |
| | b. Write a note on: | | (2) | (2) | (5) | (10) |
| | (i) Hadoop | | | | | |
| | (ii) Role of Data scientist in Data Analytics field | | | | | |

- OR**
- 8 a. Explain how data abundance and data scarcity is handled in data engineering (2) (2) (1) (06)
- b. Explain the word frequency problem. How is it tackled using MapReduce? (2) (2) (5) (06)
- c. Illustrate how modeling is done in data engineering. (2) (2) (5) (08)

Seventh Semester B.E. Makeup Examination, January 2019
ARTIFICIAL INTELLIGENCE

Time: 3 Hours

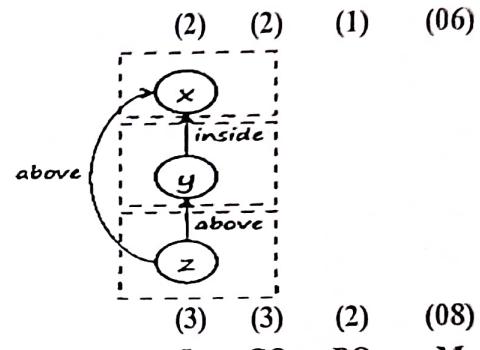
Max. Marks: 100

Instructions: 1. Unit-I and Unit-II are compulsory
 2. Answer any one full question from each of the remaining units.

UNIT - I

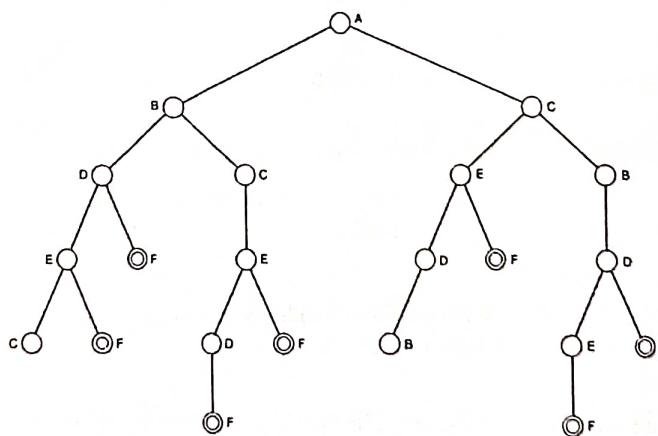
L CO PO M

- 1 a. Define
- Intelligence
 - Artificial intelligence
 - Strong Methods and Weak Methods
- (1) (1) (1) (06)
- b. Explain the Chinese Room argument, and
- present some of the arguments against it, and
 - the counter-arguments.
 - Which do you find most convincing? How does this affect your view on the overall worth of the study of Artificial Intelligence?
- (2) (2) (1) (06)
- c. Design Semantic net with appropriate frames for the following objects having relations each other:

**UNIT - II**

L CO PO M

- 2 a. Explain the differences and similarities between depth-first search and breadth-first search. Give examples of the kinds of problems where each would be appropriate. Mention the time and space complexity of depth-first search and breadth-first search.
- (2) (3) (2) (10)
- b. Write implementation of beam search in 'C' language. Analyze beam search for the following tree.

(4) (2) (2) (10)
L CO PO M**UNIT - III**

(3) (2) (1) (06)

- 3 a. Prove the following: $\vdash (\forall \rightarrow B) \rightarrow ((B \rightarrow C) \rightarrow ((C \rightarrow D) \rightarrow (\forall \rightarrow D)))$

- b. Explain the Deduction Theorem, with the rule: if $A \cup \{B\} \vdash C$ then $A \vdash (B \rightarrow C)$ (2) (1) (1) (06)
- c. Explain briefly
 a. Soundness
 b. Completeness
 c. Decidability
 d. Monotonicity (2) (1) (2) (08)

OR

- 4 a. i. What is Logic?
 ii. Why Logic is used in Artificial Intelligence?
 iii. List five Logical Operators. (1) (1) (2) (08)
- b. Translate from English to Logic notations, making use of symbols R=raining, T=Tuesday, N=New York, S=sick, T=tired:
 i. "It is raining and it is Tuesday"
 ii. "It is raining in New York"
 iii. "It is raining in New York, and I'm getting sick or just very tired" (2) (2) (1) (06)
- c. Identify the meaning of Deduction, for the logical expressions: a. $\frac{A \quad B}{A \wedge B}$ b. $\frac{A \wedge B}{A}$ c. $\frac{A \quad A \rightarrow B}{B}$ (3) (2) (2) (06)

UNIT - IV

L CO PO M

- 5 a. Explain Skolemization and Unification with examples (2) (3) (2) (10)
 b. List rules to convert a wff to prenex normal form. Also list the rules to move quantifiers to the front. (1) (3) (2) (10)

OR

- 6 a. Explain with example forward chaining and backward chaining. (2) (3) (2) (10)
 b. Write a short note on
 i) CLIPS
 ii) CYC (2) (3) (2) (10)

UNIT - V

L CO PO M

- 7 a. Explain why the blackboard architecture is an effective way to combine information from a number of knowledge sources, include its main components and explain the block schematic. (2) (1) (1) (10)
 b. Explain what kinds of problems, the Copycat architecture can solve, using block schematic. (2) (1) (1) (10)

OR

- a. i. Define an agent?
 ii. List and explain five properties of agents.
 iii. Explain briefly five types of agents. (2) (1) (1) (10)
- b. i. Explain with block diagram a three-layer subsumption architecture for an agent.
 ii. Compare Horizontal and Vertical agent architectures. (2) (1) (1) (10)

Seventh Semester B.E. Semester End Examination, Dec./Jan. 2019-20
ARTIFICIAL INTELLIGENCE

Time: 3 Hours

Max. Marks: 100

Instructions: 1. Answer one full question each from the Units

UNIT - I

- 1 a. Explain Turing test and Chinese room argument experiment. Compare and contrast. (2) (3) (2) (10)
- b. Convert the following information into semantic nets and frames:

Tom is a cat. Tom caught a bird. Tom is owned by John. Tom is ginger in color. Cats like cream. The cat sat on the mat. A cat is a mammal. A bird is an animal. All mammals are animals. Mammals have fur.

(3) (2) (2) (10)

OR

- 2 a. Explain the relationship between graphs, semantic nets, semantic trees, search spaces, and search trees. (2) (3) (2) (10)
- b. Design a suitable representation and draw the complete search tree for the following problem.

A farmer is on one side of a river and wishes to cross the river with a wolf, a chicken, and a bag of grain. He can take only one item at a time in his boat with him. He can't leave the chicken alone with the grain, or it will eat the grain, and he can't leave the wolf alone with the chicken, or the wolf will eat the chicken. How does he get all three safely across to the other side?

(5) (3) (2) (10)

UNIT - II

L CO PO M

- 3 a. Explain how you implement Depth First Search and Breadth First Search with example code. Compare both search techniques. (2) (3) (2) (10)
- b. Explain with example how you use heuristics for search. Explain the criteria for selecting a good heuristic. (2) (3) (2) (10)

OR

- 4 a. Explain different techniques to identify optimal paths. (2) (3) (2) (10)
- b. Implement a greedy-search algorithm. How well does it perform compared with the other methods you have implemented? Invent a 0-1 knapsack problem, and use your search tree implementation to model this problem. Can you model the fractional knapsack problem using a search tree? (5) (2) (1) (10)

UNIT - III

L CO PO M

- 5 a. Explain the following terms (i) Game Trees (ii) Minimax (iii) Alpha beta pruning. (2) (2) (3) (12)
- b. What is Logic? Explain Why Logic is used in Artificial Intelligence and explain Logical Operators. (2) (2) (3) (08)

OR

- 6 a. Explain the concepts of Translating between English and Logic Notation and explain the following Truth Tables of Not, And, Or, Implies, if, Complex Truth Tables. (2) (3) (2) (12)
- b. Explain deduction Theorem with an example. (2) (4) (4) (08)

- 7 a. Consider the following axioms and convert them to clausal form

- a) Every coyote chases some roadrunner.
- b) Every roadrunner who says "beep-beep" is smart.
- c) No coyote catches any smart roadrunner.
- d) Any coyote who chases some roadrunner but does not catch it is frustrated.
- e) (Conclusion) If all roadrunners say "beep-beep", then all coyotes are frustrated.

Prove the conclusion If all roadrunners say "beep-beep", then all coyotes are frustrated

- b. Explain with examples resolution in propositional logic. (3) (3) (2) (10)

OR

- 8 a. Explain with examples resolution in predicate logic.

(2) (3) (2) (10)

- b. Explain with example backward chaining.

(2) (3) (2) (10)

UNIT -V

- 9 a. Explain black board architecture with its implementation.

(2) (3) (2) (1)

L CO PO M

- b. Explain with example Dempster-Shafer theory of evidence.

(2) (3) (2) (10)

OR

- 10 a. List and explain properties of agents.

(2) (3) (2) (10)

- b. List and explain types of agents.

(2) (1) (2) (10)

(2) (1) (2) (10)

Seventh Semester B.E. Semester End Examination, Dec/Jan 2018-19
DATA SCIENCE

Time: 3 Hours

Max. Marks: 100

- Instructions:** 1. Unit I and unit II are compulsory.
 2. Answer any one full question from remaining units.

- | | | UNIT - I | L | CO | PO | M |
|---|----|---|-----|-----|-----|------|
| 1 | a. | Define data science. List out the similarities and differences between Big data and Data science. | (2) | (1) | (1) | (10) |
| | b. | Write a brief note on history of data science. Illustrate how data science is applied in different fields | (3) | (1) | (1) | (10) |
| | | UNIT - II | | | | |
| 2 | a. | Write a note on
(i) Population
(ii) Sample
(iii) Parameter
(iv) Estimation of parameters | (2) | (1) | (2) | (10) |
| | b. | Explain data science process with a neat diagram | (2) | (1) | (1) | (10) |
| | | UNIT III | | | | |
| 3 | a. | Demonstrate how least squares method is used to best fit the linear regression algorithm | (3) | (2) | (2) | (10) |
| | b. | Illustrate K means algorithm with an example | (2) | (2) | (2) | (10) |
| | | OR | | | | |
| 4 | a. | Demonstrate KNN algorithm with an example and discuss the underlying assumptions made while using KNN | (3) | (3) | (2) | (10) |
| | b. | Illustrate how predicting of house prices is done using linear regression model | (2) | (3) | (4) | (10) |
| | | UNIT - IV | | | | |
| 5 | a. | Demonstrate how Naïve Bayes algorithm is used in classification of spam filters | (3) | (3) | (2) | (10) |
| | b. | Discuss the merits and demerits of Linear Regression for Spam filtering. | (2) | (3) | (2) | (10) |
| | | OR | | | | |
| 6 | a. | Compare and contrast between Naïve Bayes and KNN algorithm in classification of messages | (4) | (3) | (1) | (10) |
| | b. | Demonstrate Linear regression model with an example | (3) | (3) | (2) | (10) |
| | | UNIT - V | | | | |
| 7 | a. | Explain map reduce considering word frequency problem as an example | (2) | (2) | (1) | (08) |
| | b. | Illustrate handling of data abundance and data scarcity in data engineering | (2) | (2) | (1) | (06) |
| | c. | Explain how modeling is done in data engineering process | (2) | (2) | (5) | (06) |
| | | OR | | | | |

- 8 a. Explain the Hadoop and MapReduce. (2) (2) (1) (10)
- b. Write a short note on: (2) (2) (5) (10)
- (i) Role of Data Scientist in Data Analytics field
 - (ii) Examples of MapReduce

Seventh Semester B.E. Semester End Examination, Dec/Jan 2018-19
ARTIFICIAL INTELLIGENCE

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. Unit I and II are compulsory.
 2. Readable question's numbers must be in allocated space.
 3. Data, if necessary, may be assumed.
 4. Sketches, when required, may be drawn.

UNIT - I

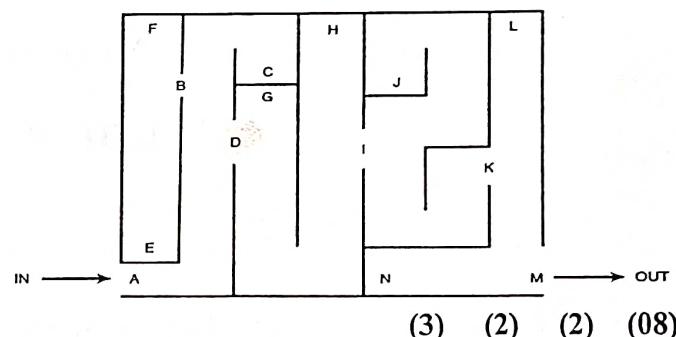
L CO PO M

- 1 a. Differentiate between
 i) Strong methods and weak methods
 ii) Strong AI and weak AI (3) (3) (2) (05)
- b. Convert the following information into:
 a) a semantic net
 b) a frame based representation
 A Ford is a type of car. Bob owns two cars. Bob parks his car at home. His house is in California, which is a state. Sacramento is the state capital of California. Cars drive on the freeway, such as Route 101 and Highway 81. (3) (3) (2) (10)
- c. Differentiate between a top-down approach and a bottom-up approach to problem solving. In what kind of situations might each be appropriate (3) (3) (2) (05)

UNIT - II

L CO PO M

- 2 a. Refer to maze, for entry, exit, dead nodes, decision nodes – identify path from entry to exit, and build an appropriate search tree.

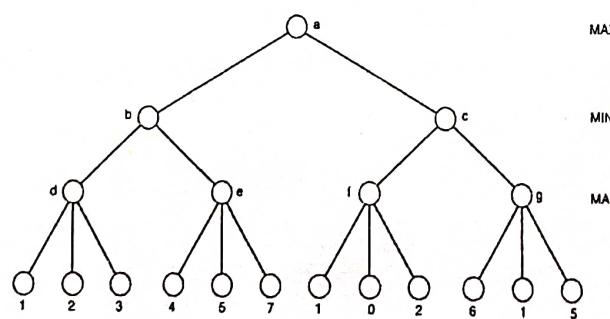


- b. Summarize the Properties of Search Methods. (1) (1) (1) (04)
- c. Solve the eight-queens problem, using Constraint Satisfaction Search method, list out the steps and chess-board sketch, too. (3) (2) (2) (08)

UNIT - III

L CO PO M

- 3 a. Apply and analyze alpha-beta pruning algorithm for the following game tree.



(4) (2) (2) (10)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)

b. Translate the following sentences in to predicate logic:

- i) Marcus was a man
- ii) All Pompeians were Romans
- iii) Everyone is loyal to someone
- iv) Marcus tried to assassinate Caesar
- v) All men are people

(2) (2) (2) (1)

OR

- 4 a. Explain effectiveness of alpha-beta pruning algorithm. Explain how alpha-beta pruning algorithm implemented with code. (2) (3) (2) (1)
- b. Prove the following:
a) $(\neg A \rightarrow B) \rightarrow (\neg B \rightarrow A)$
b) $(A \rightarrow B) \rightarrow ((B \rightarrow C) \rightarrow ((C \rightarrow D) \rightarrow (A \rightarrow D)))$ (3) (3) (1) (10)

UNIT - IV

- 5 a. Solve the phrase to to get Conjunctive Normal Form (CNF): $(A \rightarrow B) \rightarrow C$ L CO PO M
b. Explain the Resolution Rule and using the Resolution Rule resolve $\{A, B\}, \{\neg B, C\}$ (3) (2) (2) (06)
c. Illustrate with block diagram and explain the architecture of an Expert System. (2) (1) (1) (06)

- 6 a. Solve the phrase to to get Conjunctive Normal Form (CNF): $A \leftrightarrow (B \wedge C)$ L CO PO M
b. Explain the method of Proof by Reputation using an example. (3) (2) (1) (06)
c. How to build an medical expert system using backward chaining in Rule-Based Expert System. (2) (2) (1) (06)

UNIT - V

- 7 a. Write a note on
i) Blackboard Architecture
ii) Copycat Architecture L CO PO M
b. Explain Dempster Shafer Theory of evidence with an example (2) (3) (2) (10)

OR

- 8 a. Explain properties of agents (2) (3) (2) (10)
b. Explain with block diagram a three-layer subsumption architecture for an agent with suitable examples (2) (1) (2) (10)
(2) (1) (2) (10)

Instructions:

1. Unit I and unit II are compulsory
2. Answer anyone full question from remaining units

Max. Marks: 100

- | | | L | CO | PO | M |
|--|---|-----|-----|-----|------|
| 1 | a. What is data science? Illustrate the relationship between big data and data science. | (2) | (1) | (2) | (08) |
| b. Define datafication. Bring out the differences between a data analyst and data scientist. | | | | | |
| c. List and explain the different challenges that arise in processing big data. | | (2) | (1) | (2) | (08) |
| 2 | a. What is a model? Explain how modeling is done using exploratory data analysis. | (2) | (1) | (4) | (04) |
| b. Illustrate the process of data science with a diagram | | (2) | (2) | (2) | (10) |
| 3 | a. What is machine learning? Explain the machine learning algorithms. | (2) | (2) | (1) | (10) |
| b. Compare between Supervised and Unsupervised machine learning. | | (2) | (1) | (1) | (10) |
| 4 | a. Briefly explain the K Nearest Neighbour algorithm. List out the modeling assumptions to be made while using KNN algorithm. | (3) | (2) | (4) | (10) |
| b. Explain the logistic regression model | | (2) | (2) | (4) | (10) |
| 5 | a. Explain classifiers, run-time, interoperability with respect to logistic regression | (2) | (2) | (1) | (10) |
| b. Write a brief note on: <ul style="list-style-type: none"> (i) Newton's method for maximum likelihood (ii) Stochastic Gradient Descent | | (2) | (2) | (1) | (10) |
| | OR | | | | |
| 6 | a. Demonstrate how classification of spam messages is performed using Naïve Bayes algorithm | (3) | (3) | (2) | (10) |
| b. Explain why KNN and Linear regression algorithms cannot be used for filtering spam | | (2) | (2) | (2) | (10) |
| | UNIT - V | | | | |
| 7 | a. Explain MapReduce and its framework with an example | (2) | (2) | (1) | (10) |
| b. Write a note on: <ul style="list-style-type: none"> (i) Hadoop (ii) Role of Data scientist in Data Analytics field | | (2) | (2) | (5) | (10) |

OR

- a. Explain how data abundance and data scarcity is handled in data engineering (2) (2) (1) (06)
- b. Explain the word frequency problem. How is it tackled using MapReduce? (2) (2) (5) (06)
- Illustrate how modeling is done in data engineering. (2) (2) (5) (08)

Seventh Semester B.E. Makeup Examination, January 2019

ARTIFICIAL INTELLIGENCE

Time: 3 Hours

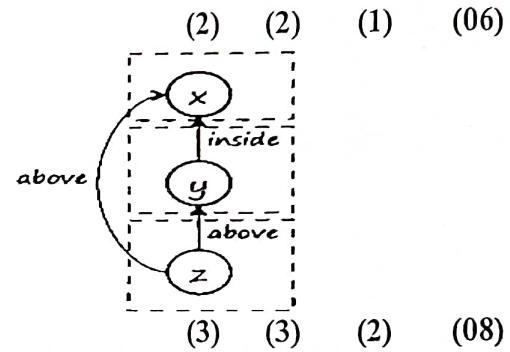
Max. Marks: 100

- Instructions:**
1. Unit-I and Unit-II are compulsory
 2. Answer any one full question from each of the remaining units.

UNIT - I

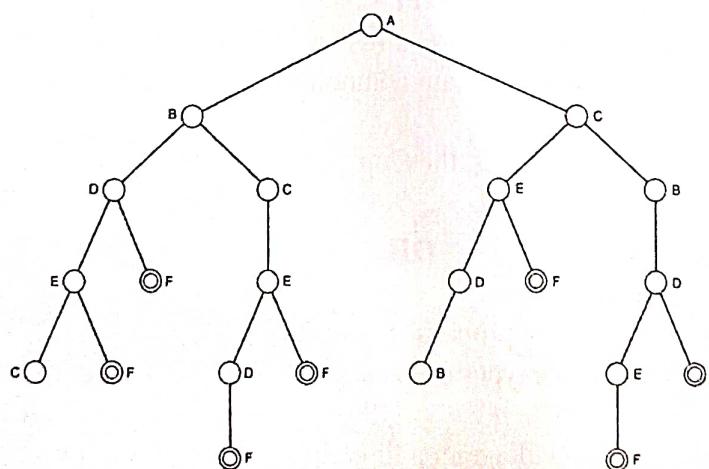
L CO PO M

- 1 a. Define
- a. Intelligence
 - b. Artificial intelligence
 - c. Strong Methods and Weak Methods
- (1) (1) (1) (06)
- b. Explain the Chinese Room argument, and
- a. present some of the arguments against it, and
 - b. the counter-arguments.
 - c. Which do you find most convincing? How does this affect your view on the overall worth of the study of Artificial Intelligence?
- (2) (2) (1) (06)
- c. Design Semantic net with appropriate frames for the following objects having relations each other:

**UNIT - II**

L CO PO M

- 2 a. Explain the differences and similarities between depth-first search and breadth-first search. Give examples of the kinds of problems where each would be appropriate. Mention the time and space complexity of depth-first search and breadth-first search.
- (2) (3) (2) (10)
- b. Write implementation of beam search in 'C' language. Analyze beam search for the following tree.

(4) (2) (2) (10)
L CO PO M**UNIT - III**

- 3 a. Prove the following: $\vdash (\forall \rightarrow B) \rightarrow ((B \rightarrow C) \rightarrow ((C \rightarrow D) \rightarrow (\forall \rightarrow D)))$

(3) (2) (1) (06)

- b. Explain the Deduction Theorem, with the rule: if $\Lambda \cup \{B\} \vdash C$ then $\Lambda \vdash (B \rightarrow C)$ (2) (1) (1) (06)
- c. Explain briefly
 a. Soundness
 b. Completeness
 c. Decidability
 d. Monotonicity (2) (1) (2) (08)

OR

- 4 a. i. What is Logic?
 ii. Why Logic is used in Artificial Intelligence?
 iii. List five Logical Operators. (1) (1) (2) (08)
- b. Translate from English to Logic notations, making use of symbols R=raining, T=Tuesday, N=New York, S=sick, T=tired:
 i. "It is raining and it is Tuesday"
 ii. "It is raining in New York"
 iii. "It is raining in New York, and I'm getting sick or just very tired" (2) (2) (1) (06)
- c. Identify the meaning of Deduction, for the logical expressions: a. $\frac{A \quad B}{A \wedge B}$ b. $\frac{A \wedge B}{A}$ c. $\frac{A \quad A \rightarrow B}{B}$ (3) (2) (2) (06)

UNIT - IV

L	CO	PO	M
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- 5 a. Explain Skolemization and Unification with examples (2) (3) (2) (10)
 b. List rules to convert a wff to prenex normal form. Also list the rules to move quantifiers to the front. (1) (3) (2) (10)

OR

- 6 a. Explain with example forward chaining and backward chaining. (2) (3) (2) (10)
 b. Write a short note on
 i) CLIPS
 ii) CYC (2) (3) (2) (10)

UNIT - V

L	CO	PO	M
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- 7 a. Explain why the blackboard architecture is an effective way to combine information from a number of knowledge sources, include its main components and explain the block schematic. (2) (1) (1) (10)
 b. Explain what kinds of problems, the Copycat architecture can solve, using block schematic. (2) (1) (1) (10)

OR

- 8 a. i. Define an agent?
 ii. List and explain five properties of agents.
 iii. Explain briefly five types of agents. (2) (1) (1) (10)
 b. i. Explain with block diagram a three-layer subsumption architecture for an agent.
 ii. Compare Horizontal and Vertical agent architectures. (2) (1) (1) (10)

Seventh Semester B.E. Semester End Examination, Dec/Jan 2018-19
DATA SCIENCE

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. Unit I and unit II are compulsory.
 2. Answer any one full question from remaining units.

1 a. Define data science. List out the similarities and differences between Big data and Data science. **UNIT - I** (2) (1) (1) (10)

b. Write a brief note on history of data science. Illustrate how data science is applied in different fields (3) (1) (1) (10)

2 a. Write a note on
 (i) Population (2) (1) (2) (10)
 (ii) Sample
 (iii) Parameter
 (iv) Estimation of parameters

UNIT - II

b. Explain data science process with a neat diagram (2) (1) (1) (10)

3 a. Demonstrate how least squares method is used to best fit the linear regression algorithm (3) (2) (2) (10)

b. Illustrate K means algorithm with an example (2) (2) (2) (10)

OR

4 a. Demonstrate KNN algorithm with an example and discuss the underlying assumptions made while using KNN (3) (3) (2) (10)

b. Illustrate how predicting of house prices is done using linear regression model (2) (3) (4) (10)

UNIT - IV

5 a. Demonstrate how Naïve Bayes algorithm is used in classification of spam filters (3) (3) (2) (10)

b. Discuss the merits and demerits of Linear Regression for Spam filtering. (2) (3) (2) (10)

OR

a. Compare and contrast between Naïve Bayes and KNN algorithm in classification of messages (4) (3) (1) (10)

b. Demonstrate Linear regression model with an example (3) (3) (2) (10)

UNIT - V

a. Explain map reduce considering word frequency problem as an example (2) (2) (1) (08)

b. Illustrate handling of data abundance and data scarcity in data engineering (2) (2) (1) (06)

c. Explain how modeling is done in data engineering process (2) (2) (5) (06)

OR

- 8 a. Explain the Hadoop and MapReduce. (2) (2) (1) (10)
- b. Write a short note on:
(i) Role of Data Scientist in Data Analytics field (2) (2) (5) (10)
(ii) Examples of MapReduce

Seventh Semester B.E. Semester End Examination, Dec/Jan 2018-19
ARTIFICIAL INTELLIGENCE

Time: 3 Hours

Max. Marks: 100

- Instructions:**
1. Unit I and II are compulsory.
 2. Readable question's numbers must be in allocated space.
 3. Data, if necessary, may be assumed.
 4. Sketches, when required, may be drawn.

UNIT - I

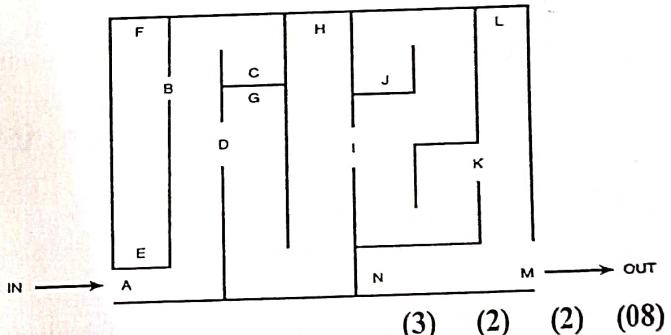
L CO PO M

- 1 a. Differentiate between
 i) Strong methods and weak methods
 ii) Strong AI and weak AI (3) (3) (2) (05)
- b. Convert the following information into:
 a) a semantic net
 b) a frame based representation
 A Ford is a type of car. Bob owns two cars. Bob parks his car at home. His house is in California, which is a state. Sacramento is the state capital of California. Cars drive on the freeway, such as Route 101 and Highway 81. (3) (3) (2) (10)
- c. Differentiate between a top-down approach and a bottom-up approach to problem solving. In what kind of situations might each be appropriate (3) (3) (2) (05)

UNIT - II

L CO PO M

- 2 a. Refer to maze, fo entry, exit, dead nodes, decision nodes – identify path from entry to exit, and build an appropriate search tree.

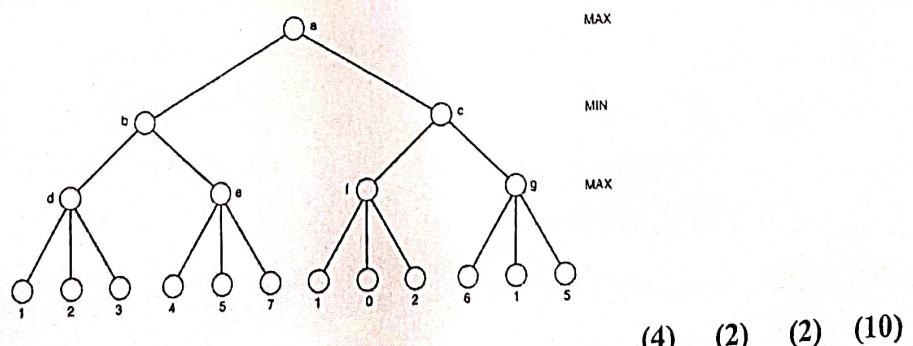


- b. Summarize the Properties of Search Methods. (1) (1) (1) (04)
- c. Solve the eight-queens problem, using Constraint Satisfaction Search method, list out the steps and chess-board sketch, too. (3) (2) (2) (08)

L CO PO M

UNIT - III

- 3 a. Apply and analyze alpha-beta pruning algorithm for the following game tree.



(4) (2) (2) (10)

- b. Translate the following sentences in to predicate logic:
- Marcus was a man
 - All Pompeians were Romans
 - Everyone is loyal to someone
 - Marcus tried to assassinate Caesar
 - All men are people

(2) (2) (2) (10)

OR

- 4 a. Explain effectiveness of alpha-beta pruning algorithm. Explain how alpha-beta pruning algorithm is implemented with code.
- b. Prove the following:
- $(\neg A \rightarrow B) \rightarrow (\neg B \rightarrow A)$
 - $(A \rightarrow B) \rightarrow ((B \rightarrow C) \rightarrow ((C \rightarrow D) \rightarrow (A \rightarrow D)))$

(2) (3) (2) (10)

(3) (3) (1) (10)

UNIT - IV

- 5 a. Solve the phrase to to get Conjunctive Normal Form (CNF): $(A \rightarrow B) \rightarrow C$
- b. Explain the Resolution Rule and using the Resolution Rule resolve $\{A, B\}, \{\neg B, C\}$
- c. Illustrate with block diagram and explain the architecture of an Expert System.

L CO PO M

(3) (2) (2) (06)

(2) (1) (1) (06)

(2) (1) (1) (08)

OR

- 6 a. Solve the phrase to to get Conjunctive Normal Form (CNF): $A \leftrightarrow (B \wedge C)$
- b. Explain the method of Proof by Reputation using an example.
- c. How to build an medical expert system using backward chaining in Rule-Based Expert System.

L CO PO M

(3) (2) (1) (06)

(2) (2) (1) (06)

(1) (2) (1) (08)

UNIT - V

- 7 a. Write a note on
- Blackboard Architecture
 - Copycat Architecture
- b. Explain Dempster Shafer Theory of evidence with an example

L CO PO M

(2) (3) (2) (10)

(2) (3) (2) (10)

OR

- 8 a. Explain properties of agents
- b. Explain with block diagram a three-layer subsumption architecture for an agent with suitable examples

(2) (1) (2) (10)

(2) (1) (2) (10)