
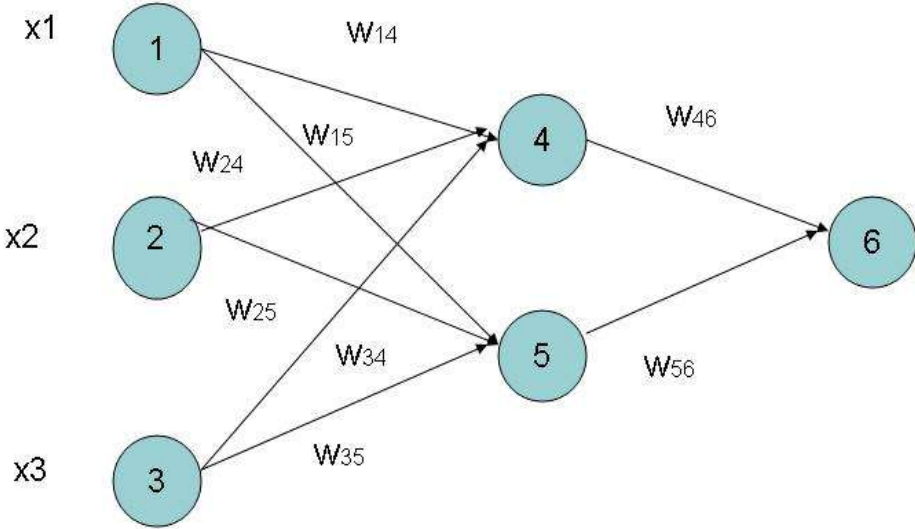


Name:			
Enrolment No:			
<b>UPES</b> <b>End Semester Examination, May 2024</b>			
<b>Course: Machine Learning - Using Data for Artificial Intelligence</b> <b>Program: MCA</b> <b>Course Code: CSAI7018P</b>		<b>Semester : 2<sup>nd</sup></b> <b>Time : 03 hrs.</b> <b>Max. Marks: 100</b>	
<b>Instructions: Attempt all questions. The last question of Sections B and C has an internal choice.</b>			
<b>SECTION A</b> <b>(5Qx4M=20Marks)</b>			
S. No.		Marks	CO
Q 1	Discuss the term Machine Learning.	4	CO1
Q 2	Discuss and differentiate: Supervised Learning, Unsupervised Learning and Reinforcement Learning.	4	CO1
Q 3	How is Artificial Intelligence related to Machine learning and Deep learning? Explain it by giving the block diagram related to these three concepts.	4	CO2
Q 4	Write a detailed note on the “Classification” in Machine Learning. Take your own day-to-day examples to explain different types of predictive models of Classification in machine learning.	4	CO3
Q 5	What is reinforcement learning? State one practical example.	4	CO4
<b>SECTION B</b> <b>(4Qx10M= 40 Marks)</b>			
Q 6	Discuss linear regression by taking a suitable example of your own. <b>OR</b> Differentiate between logistic regression and linear regression?	10	CO2
Q 7	How Naive Bayes Algorithms works? Support your answer by taking a suitable Python code.	10	CO3
Q 8	How does the SVM work? Support your answer by taking a suitable Python code.	10	CO2

<b>Q 9</b>	<p>In the below mini-dataset, the label we're trying to predict is the type of fruit. This is based off the size, color, and shape variables.</p> <table border="1"> <thead> <tr> <th>Fruit</th> <th>Size</th> <th>Color</th> <th>Shape</th> </tr> </thead> <tbody> <tr> <td>Watermelon</td> <td>Big</td> <td>Green</td> <td>Round</td> </tr> <tr> <td>Apple</td> <td>Medium</td> <td>Red</td> <td>Round</td> </tr> <tr> <td>Banana</td> <td>Medium</td> <td>Yellow</td> <td>Thin</td> </tr> <tr> <td>Grape</td> <td>Small</td> <td>Green</td> <td>Round</td> </tr> <tr> <td>Grapefruit</td> <td>Medium</td> <td>Yellow</td> <td>Round</td> </tr> <tr> <td>Lemon</td> <td>Small</td> <td>Yellow</td> <td>Round</td> </tr> </tbody> </table> <p>i. Calculate the information gained if we select the color variable.  ii. Calculate the information gained if we select the size variable.  iii. Calculate the information gained if we select the shape variable.</p>	Fruit	Size	Color	Shape	Watermelon	Big	Green	Round	Apple	Medium	Red	Round	Banana	Medium	Yellow	Thin	Grape	Small	Green	Round	Grapefruit	Medium	Yellow	Round	Lemon	Small	Yellow	Round	<p style="text-align: center;"><b>10</b></p>	<p style="text-align: center;"><b>CO3</b></p>
Fruit	Size	Color	Shape																												
Watermelon	Big	Green	Round																												
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**SECTION-C**  
**(2Qx20M=40 Marks)**

<b>Q 10</b>	<p>Discuss the Artificial Neural Network and compare it with the human brain by taking suitable examples. Compare and contrast a Standard Computer with Artificial Neural Networks. How do ANNs work?</p>	<p style="text-align: center;"><b>20</b></p>	<p style="text-align: center;"><b>CO3</b></p>
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<b>Q 11</b>	<p>Consider the following ANN:</p> 	<p style="text-align: center;"><b>20</b></p>	<p style="text-align: center;"><b>CO3/CO 4</b></p>
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x 1	x2	x3	w1 4	w15	w2 4	w2 5	w3 4	w3 5	w4 6	w5 6
1	0	1	0.2	- 0.3	0.4	0.1	- 0.5	0.2	- 0.3	- 0.2

**With Bias as:**

04	05	06
-0.4	0.2	0.1

**Calculate the Net Input  $I_j$  and Output  $O_j$ . Calculate also the Error at each Node.**

**OR**

**How does Reinforcement Learning Work? Take your own example to demonstrate it. Explain types of reinforcement learning: (Positive & Negative reinforcement). What is the Bellman Equation? How is it helpful in RL?**