


<b>Name:</b> <b>Enrolment No:</b>			
<b>UPES</b> <b>End Semester Examination, May 2023</b>			
<b>Course: Machine Learning</b> <b>Semester: II</b> <b>Program: M.Tech(CSE)AI</b> <b>Course Code: CSAI 7001</b>		<b>Time: 03 hrs.</b> <b>Max. Marks: 100</b>	
<b>Instructions:</b>			
<b>SECTION A</b> <b>(5Qx4M=20Marks)</b>			
S. No.		Marks	CO
Q 1	What are the different aspects of developing a learning system	4	CO1
Q 2	How does AVL tree differ from binary search tree?	4	CO2
Q3	What is ensemble learning?	4	CO2
Q4	What are the possible causes of overfitting?	4	CO4
Q5	Write a short note on clustering.	4	CO6
<b>SECTION B</b> <b>(4Qx10M= 40 Marks)</b>			
Q 6	Describe the process of Hierarchical Agglomerative Clustering.	10	CO6
Q7	Show with an example, the process of finding maximum margin separator through quadratic programming.	10	CO4
Q8	Find out the final hypothesis with Find S algorithm on the following data:	10	CO1

EXAMPLE	COLOR	TOUGHNESS	FUNGUS	APPEARANCE	POISONOUS
1.	GREEN	HARD	NO	WRINKLED	YES
2.	GREEN	HARD	YES	SMOOTH	NO
3.	BROWN	SOFT	NO	WRINKLED	NO
4.	ORANGE	HARD	NO	WRINKLED	YES
5.	GREEN	SOFT	YES	SMOOTH	YES
6.	GREEN	HARD	YES	WRINKLED	YES
7.	ORANGE	HARD	NO	WRINKLED	YES

Q9	<p>Explain the process of active learning with ensembles. Or Discuss about searching, insertion and deletion of a binary search tree with an example.</p>	<b>10</b>	<b>CO2</b>
<p><b>SECTION-C</b> <b>(2Qx20M=40 Marks)</b></p>			
Q 10	<p>Discuss in detail, how bias in estimation and estimation variability affects the accuracy of learned hypothesis. Discuss in detail, the importance of probably approximately correct (PAC) learning. Or Discuss in detail, about different methods to prevent overfitting.</p>	<p><b>10+10</b> <b>Or</b> <b>20</b></p>	<b>CO3</b>
Q11	<p>What is the importance of parameter smoothing? Differentiate between generative and discriminative training. Describe how Bayes nets can be used for representing dependencies.</p>	<b>5+5+10</b>	<b>CO5</b>