



R20 Regulation

Subject code:3E6EF

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

(Autonomous, Accredited by NAAC with 'A+' Grade)

**B.Tech VI Semester Regular/Supplementary Examinations, July 2024**

**MACHINE LEARNING**  
(COMPUTER SCIENCE & ENGINEERING)

Maximum Marks: 70

Date:26.07.2024 Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
  2. Part A is compulsory and carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
  4. Each question carries 10 marks and may have a, b, c, d as sub-questions.

Part-A

All the following questions carry equal marks		(10X2M=20 Marks)	CO	Bloom Tx
1	What is machine learning and mention any two applications?		CO1	L1
2	What is meant by Predictive rule learning?		CO1	L1
3	List the issues involved in decision tree learning.		CO2	L1
4	List the applications of Neural Networks in Machine Learning.		CO2	L1
5	Give the significance of the least squares method.		CO3	L1
6	List the Radial Basis Functions.		CO3	L1
7	Illustrate the FOIL algorithm.		CO4	L1
8	What is PROLOG?		CO4	L1
9	What is Reinforce Learning Task and Q Learning?		CO5	L1
10	Define analytical and inductive learning.		CO5	L1

Part-B

Answer All the following questions.		(5X10M=50Marks)		
11	A. Explain a well-posed learning algorithm with getting trained for playing cricket and spam detection in mail learning problems. [5] B. Explain the following i. Most general consistent hypothesis. [3] ii. Closed concepts in a path through the hypothesis. [2]		CO1	L2  L2

OR

12	A.Explain about consistent hypothesis and version space for the given data: [5]		CO1	L2 L2
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Example	Citations	Size	InLibrary	Price	Editions	Buy
1	Some	Small	No	Affordable	One	No
2	Many	Big	No	Expensive	Many	Yes

h1 = (?, ?, No, ?, Many)      -

h2 = (?, ?, No, ?, ?)      -

	B. Explain the algorithm, and flow chart of the ‘find-S’ algorithm and implement its concept for the given example. [5]																																												
	<table border="1"> <thead> <tr> <th>Example</th> <th>Eyes</th> <th>Nose</th> <th>Head</th> <th>Fcolor</th> <th>Hair</th> <th>Smile</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Round</td> <td>Triangle</td> <td>Round</td> <td>Purple</td> <td>Yes</td> <td>Yes</td> </tr> <tr> <td>2</td> <td>Square</td> <td>Square</td> <td>Square</td> <td>Green</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>3</td> <td>Square</td> <td>Triangle</td> <td>Round</td> <td>Yellow</td> <td>Yes</td> <td>Yes</td> </tr> <tr> <td>4</td> <td>Round</td> <td>Triangle</td> <td>Round</td> <td>Green</td> <td>No</td> <td>No</td> </tr> <tr> <td>5</td> <td>Square</td> <td>Square</td> <td>Round</td> <td>Yellow</td> <td>Yes</td> <td>Yes</td> </tr> </tbody> </table>	Example	Eyes	Nose	Head	Fcolor	Hair	Smile	1	Round	Triangle	Round	Purple	Yes	Yes	2	Square	Square	Square	Green	Yes	No	3	Square	Triangle	Round	Yellow	Yes	Yes	4	Round	Triangle	Round	Green	No	No	5	Square	Square	Round	Yellow	Yes	Yes		
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13	<p>A. Compute the decision tree algorithm for the given data. [5]</p> <table border="1"> <thead> <tr> <th>Day</th> <th>Temp</th> <th>Humidity</th> <th>Wind</th> <th>Play Tennis</th> </tr> </thead> <tbody> <tr> <td>D4</td> <td>Mild</td> <td>High</td> <td>Weak</td> <td>Yes</td> </tr> <tr> <td>D5</td> <td>Cool</td> <td>Normal</td> <td>Weak</td> <td>Yes</td> </tr> <tr> <td>D6</td> <td>Cool</td> <td>Normal</td> <td>Strong</td> <td>No</td> </tr> <tr> <td>D10</td> <td>Mild</td> <td>Normal</td> <td>Weak</td> <td>Yes</td> </tr> <tr> <td>D14</td> <td>Mild</td> <td>High</td> <td>Strong</td> <td>No</td> </tr> </tbody> </table> <p>B. Describe hypothesis space in concept learning. [5]</p>	Day	Temp	Humidity	Wind	Play Tennis	D4	Mild	High	Weak	Yes	D5	Cool	Normal	Weak	Yes	D6	Cool	Normal	Strong	No	D10	Mild	Normal	Weak	Yes	D14	Mild	High	Strong	No	CO2	L3  L6												
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14	<p>A. Define Perception Explain the representational power of Perceptions. [5]</p> <p>B. Discuss the general approach for deriving confidence intervals. [5]</p>	CO2	L2 L3																																										
15	<p>A. List and explain the Bayes theorem principles. [5]</p> <p>B. Explain Naïve Bayes classifier in detail. [5]</p>	CO3	L2 L2																																										
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16	<p>Write a short note on the following</p> <p>A. Sample complexity for Finite Hypothesis Space. [5]</p> <p>B. Radial Basis Functions. [5]</p>	CO3	L2																																										
17	<p>A. How does the learning process differ from ordered rule list to unordered rule list? [5]</p> <p>B. Explain the Sequential Covering Algorithm in detail. [5]</p>	CO4	L2 L2																																										
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18	Explain in detail about PROLOG-EBG with an example. [10]	CO4	L2																																										
19	What is inductive and deductive learning? Discuss the differences in detail. [10]	CO5	L2																																										
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20	Explain the Q-learning algorithm computing reward and Q-output using reinforcement learning. [10]	CO5	L2																																										