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TEST-1 EXAMINATION- 2019

B.Tech (CSE &IT)

COURSE CODE: 17B1WCI814 MAX. MARKS: 15

COURSE NAME: Design and Analysis of Real World Algorithms

COURSE CREDITS: 3 MAX. TIME: 1 Hr

Note: *All questions are compulsory.*

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1. Explain the working of ID3 algorithm with the help of an example? **[3 Marks]**

2. In what ways can a hash value be secured so as to provide message authentication? **[3 Marks]**

3. What is the need for digital signatures? Explain important properties of digital signatures. **[3 Marks]**

4. Apply the candidate elimination (CE) algorithm to the sequence of training examples specified in Table A and name the contents of the sets S and G after each step. **[3 Marks]**

Table A: List of training instances for the medical diagnosis task

Training	***running nose***	***coughing***	***reddened skin***	***Classification***
d1	+	+	+	positive (ill)
d2	+	+	-	positive (ill)
d3	+	-	+	negative (healthy)
d4	-	+	+	negative (healthy)
d5	-	-	+	negative (healthy)
d6	-	-	-	negative (healthy)

5. Given that the attribute ***Sky*** has three possible values, and that ***AirTemp, Humidity, Wind, Water,*** and ***Forecast each have*** two possible values.

Table A: The ***EnjoySport*** concept learning ***task***

Sky (with possible values ***Sunny, Cloudy,*** and ***Rainy)***
AirTemp (with values ***Warm*** and ***Cold)***
Humidity (with values ***Normal*** and ***High),***
Wind (with values ***Strong*** and ***Weak),***
Water (with values ***Warm*** and ***Cool),*** and
Forecast (with values ***Same*** and ***Change)***

Explain why the size of the hypothesis space in the *EnjoySport* learning task is 973. How would the number of possible instances and possible hypotheses increase with the addition of the attribute **Watercurrent**, which can take on the values ***Light***, ***Moderate***, or ***Strong***? More generally, how does the number of possible instances and hypotheses grow with the addition of a new attribute A that takes on k possible values? **[3 Marks]**