

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST 3 EXAMINATION- MAY 2018

B.Tech (VIII) Semester

COURSE CODE: 17B1WCI814

MAX. MARKS: 35

COURSE NAME: Design and Analysis of Real World Algorithms

COURSE CREDITS: 3

MAX. TIME: 2 Hr

Note: All questions are compulsory.

1. [5 Marks]

Give decision trees to represent the following boolean functions:

(a) $A \text{ XOR } B$ (b) $[A \wedge B] \vee [C \wedge D]$

2. [5 Marks]

ID3 searches for just one consistent hypothesis. Show the decision tree that would be learned by ID3 assuming it is given the four training examples for the *Enjoy Sport* target concept shown in Table 1.Table 1: Positive and negative training examples for the target concept *EnjoySport*

Example	Sky	AirTemp	Humidity	Wind	Water	Forecast	EnjoySport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

3. [5 Marks]

Consider the following set of training examples:

Instance	Classification	a_1	a_2
1	+	T	T
2	+	T	T
3	-	T	F
4	+	F	F
5	-	F	T
6	-	F	T

(a) What is the entropy of this collection of training examples with respect to the target function classification?

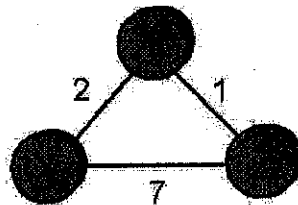
(b) What is the information gain of a_2 relative to these training examples?

4. [5 Marks]

Give an example for Map Reduce Calculations.

5. [5 Marks]

Consider the network shown below and assume that each node initially knows the costs to each of its neighbors. Consider the distance vector algorithm and show the distance table entries at node X.



6. [10 Marks]

Write short notes on the following:

- a. Voronoi Diagram b. Support Vector Machines c. Logistic regression d. Random Walk