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October 2, 2000



cs330 - Discrete Structures Fall 2000

Midterm Exam

closed books, closed notes

Starts:8:35 am

Ends: **9:50 am**

Name:_____(please print)

ID: _____

Problem	Max points	Your mark	Comments
1	10		10*1
2	15		5*3
3	10		4+3+3
4	5		
5	12		4*3
6	8		2*4
	60		

1	• Let $A = \{a \ \{b\} \ ? \}$	Mark with true (T) or	r false (F) each of t	he following statements:
-	$L \bullet L \cap \Pi = \{u, \{v\}, v\}$	f. Mark with thus (1) 0.	I faise (I') cach of t	ne tonowing statements.

Statement	T/F
a ? A	
a ? A	
? ?? ?A	
A?? ??	
{?} } ? A	

Statement	T/F
$\{a\} ? A$	
$\{b\}?A$	
?? ??? A	
? ? A	
$\{a, b\}$? power(A)	

2. Let $S = \{1, 2, 3, 4\}$ and a relation *R* on *S* defined as

a R b if and only if (a+b) < 2b, a, b? S

a) show the set representation of R





d) mark with true (T) or false (F) the following statements. If your answer is true then give an example

Statement	Your answer (T/F)	Example
There is a cycle in the digraph		
There is a path of length 3 in the digraph of R		

e) Decide whether the relation R on S is an equivalence relation or not. If it is then show the partition it creates on S.

3. This is the postfix (reverse Polish) notation for an algebraic expression:

xy*cd+ef/--a*

a) Show the tree representation of this expression.

b) Show the corresponding algebraic expression



c) Show the prefix notation for the expression.

4. Let G be the graph below:



Do a graph traversal for this graph starting with the vertex given by the right-most digit of your Social Security Number (if that digit is 9, then the start vertex will be 0). Use a breadth first algorithm with lexicographic ordering when choosing a vertex.

5. Give a definition for:

a) alphabet

b) relation

c) the power set of a set

d) tree

6. Explain the difference between:

a) a set S and a partition of the set S

b) a set and a list

