

Due: Friday, April 13, 2018

Name 1(Print) _____

CSE Login _____

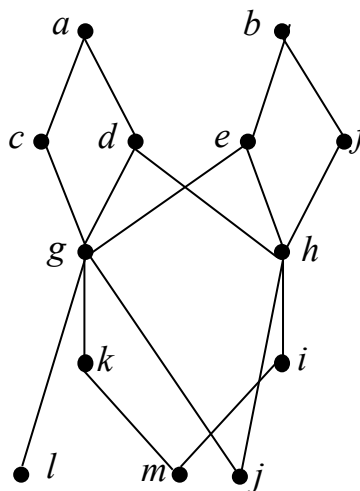
Name 2(Print) _____

CSE Login _____

Problem	Page	Notes	Points	Score
A	n/a		9	
B	n/a		6	
C	n/a		6	
D	n/a		6	
E	n/a		6	
3.1:2 (abcd)	202	Use "Properties of Algorithms" on page 193	8	
3.1:4	202		3	
3.1:24	203	Use pseudocode	8	
3.1:32	203	Use pseudocode	8	
Typesetting (bonus)			6	
Total			60	

Problem A The diagram at the right is the Hasse diagram for a partially ordered set. Referring to this diagram:

1. List the maximal elements
2. List the minimal elements
3. Find all upper bounds for f, g
4. Find all lower bounds for d, f
5. Find $\text{lub}(g, j, m)$
6. Find $\text{glb}(d, e)$
7. Find the greatest element
8. Find the least element
9. Use a topological sort to order the elements of the poset represented by this Hasse diagram.



Problem B Use the Principle of Mathematical Induction to prove that

$$1 + 2^n \leq 3^n \text{ for all } n \geq 1$$

Problem C Use the Principle of Mathematical Induction to prove that

$$2|(n^2 + n) \text{ for all } n \geq 0$$

Problem D Use the Principle of Mathematical Induction to prove that

$$1 + 4 + 7 + 10 + \cdots + (3n - 2) = \frac{n(3n - 1)}{2} \text{ for all } n \geq 1$$

Problem E Suppose that the only paper money consists of 3-dollar bills and 10-dollar bills. Show that any dollar amount greater than 17 dollars could be made from a combination of these bills.

Instructions Follow instructions *carefully*, failure to do so may result in points being deducted.

- The homework must be submitted on paper. Homework *neatly* formatted in L^AT_EX will receive a 10 percent bonus. When formatting in L^AT_EX, submit both the .tex and .pdf files via handin, in addition to the hard copy. You will not receive the bonus points if you work with a partner (see below).
- Clearly label each problem and submit answers *in order*.
- Staple this cover page to the front of your assignment for easier grading.
- Late submissions *will not be accepted*.
- When you are asked to prove something, you must give a formal, rigorous, and complete a proof as possible. Each step in your proof must contain explanation that would allow us to understand what theorem/logic you have applied to arrive at that step.
- You are to work individually, and all work should be your own. Check partner policy below.
- The CSE academic dishonesty policy is in effect (see http://cse.unl.edu/ugrad/resources/academic_integrity.php).

Partner Policy You may work in pairs, but you must follow these guidelines:

1. You must work *all* problems *together*. You may not simply partition the work between you.
2. You must use L^AT_EX and you may divide the typing duties however you wish.
3. You may not discuss the problems with other groups or individuals.
4. Hand in only one hard copy with both author's names.