

3) (10 pts) ANL (Summations)

Recall that $\sum_{i=0}^{n-1} 2^i = 2^n - 1$.

(a) (8 pts) Using this result, determine a closed-form solution in terms of n , for the summation below.

(b) (2 pts) Determine the numeric value of the summation for $n = 9$.

$$\sum_{i=0}^n \left(\sum_{j=0}^{i-1} 2^j \right)$$

Computer Science Foundation Exam

May 19, 2018

Section II B

ALGORITHMS AND ANALYSIS TOOLS

**NO books, notes, or calculators may be used,
and you must work entirely on your own.**

Name: _____

UCFID: _____

NID: _____

Question #	Max Pts	Category	Score
1	10	DSN	
2	10	DSN	
3	5	ALG	
TOTAL	25		

You must do all 3 problems in this section of the exam.

Problems will be graded based on the completeness of the solution steps and not graded based on the answer alone. Credit cannot be given unless all work is shown and is readable. Be complete, yet concise, and above all be neat. For each coding question, assume that all of the necessary includes (stdlib, stdio, math, string) for that particular question have been made.