3) (5 pts) ANL (Summations)

Solve the summation below. Your final result should be a function in terms of ***n***.

$$\sum_{k=1}^{2n}(\frac{k}{2}+3)$$

$$\sum_{k=1}^{2n}\left(\frac{k}{2}+3\right)=\left(\frac{1}{2}\sum_{k=1}^{2n}k\right)+(\sum_{k=1}^{2n}3)$$

$$=\frac{1}{2}\times\frac{2n(2n+1)}{2}+3(2n)$$

$$=\frac{n(2n+1)}{2}+\frac{12n}{2}$$

$$=\frac{2n^2+n+12n}{2}$$

$$=\boldsymbol{n^2+\frac{13}{2}n}$$

Grading: 1 pt – split sum
2 pts – correct plug in for formula sum of k
2 pts – simplify to correct answer (give 1 pt if final form isn't either factored or polynomial form but if progress is made)

Computer Science Foundation Exam

August 26, 2023

Section D

ALGORITHMS

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

SOLUTION

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