

Sample Exam Questions (Weeks 1-5) Solutions

Part A multiple choice

- 1 b
- 2 d
- 3 b
- 4 b
- 5 b

Part B short answer

Q1 a

| | | | | | | | | |
|----|----|------|------|----|------|------|------|------|
| | | G3,1 | | | B5,3 | E6,4 | | |
| | D2 | D2 | D2,2 | F4 | F4 | F4 | F4,5 | |
| A1 | A1 | A1 | A1 | A1 | A1 | A1 | A1 | A1,6 |

Q1 b

A | D F G | B E

Q1 c

No

Q2 a

Returns the index of the first item on the array that has exactly k-1 items greater than it in the array

Q2 b

$O(n^2)$

Q 3

$$C(n) = 3C(n-1) \quad n > 1$$

$$C(1) = 4$$

Telescoping / repeated substitution results in

$$C(n) = 3^i C(n-i)$$

Note: steps omitted from sample solution

Let $i=n-1$

$$C(n) = 3^{(n-1)} C(1)$$

$$C(n) = 4/3 \cdot 3^n$$

Thus $O(3^n)$