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Question 2:

(a) $O(2^n)$

(b) $O(n^4)$

(c) $O(n^{0.7})$

Question 3

(a) 1. F

2. F

3. T

4. T

(b) $O(n^3)$

Question 4

(a) $O(n^2)$

(b) $O(2^n \cdot n^2)$

(c) $O(n^3)$

(d) $O(\max(2n^2 \log_2 n), m)$

Question 5:

a) $i=0$, $j=1$ to $n-1$ the 2^{nd} for loop is executed $n-1$ times

$i=1$, $j=2$ to $n-1$ $n-2$ times

$\vdots$ $\vdots$

$i=n-2$, $j=n-1$ to $n-1$ 1 times

The loop body is executed at $1+2+\cdots+n-1$ times in total,

and only one statement is executed by one iteration.

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

plus the statement at the beginning: $\frac{n(n-1)}{2}+1 = \frac{n^2+n+1}{2}$

(b) $O\left(\frac{n(n-1)}{2}+1\right) = O(n^2)$

Question 6:

The active operation is the for loop condition.

Number of executions of the active operation: $1+2+\cdots+(n-1) = \frac{n(n-1)}{2}$

Cost of active operation: 1

$O\left(\frac{n(n-1)}{2}\right) = O(n^2)$