Q3: (a):

	Time.
line 1:	1
line 2:	1
line 3:	$a_3(\frac{n}{2})^2$
line 4:	a_4
line 5:	$T(n-2)$

So, $T(n) = T(n-2) + O(n^2) + O(1)$

$= T(n-2) + O(n^2)$

$$T(n) = T(\tfrac{n}{5}) + T(\tfrac{n}{5}) + n$$
$$= 2T(\tfrac{n}{5}) + n$$

Assume that $T(n) \le c \cdot n$ for some $c > 0$ and $n < k$

prove : $T(n=k) \le ck$ when $n = k$:

$T(n) = 2T(\frac{n}{5}) + n$, because $\frac{n}{5} < k$ when $n = k$

$= 2T(\frac{k}{5}) + k \le 2 \cdot c \cdot \frac{k}{5} + k \le c \cdot k$

$\Rightarrow \frac{2}{5}ck + k \le ck$

$\Rightarrow \frac{7}{5} \le c$

So, there must exist a constant c that can make $T(n=k) \le c \cdot k$ when $c \ge \frac{7}{5}$.