3(c)

We know that $a_1^T = (1\ 0\ 2\ -1)$

$a_2^T = (0\ 1\ -1\ 0)$

~~$a_4^T = (0\ 0\ 1\ 2)$~~ are active at $(1,1,1,2)^T$.

$a_5^T = (-3\ 0\ 0\ 1)$

In order that $p = (-1\ 1\ 1\ a)$ to be a feasible direction we have

$a_1^T p \geq 0$ which implies $(1\ 0\ 2\ -1)\begin{pmatrix} -1 \\ 1 \\ 1 \\ a \end{pmatrix} = 1 - a \geq 0$

$\Rightarrow \boxed{a \leq 1}$

$a_2^T p \geq 0$ which implies $(0\ 1\ -1\ 0)\begin{pmatrix} -1 \\ 1 \\ 1 \\ a \end{pmatrix} = 1 > 0$

$a_5^T p \geq 0$ which implies $(-3\ 0\ 0\ 1)\begin{pmatrix} -1 \\ 1 \\ 1 \\ a \end{pmatrix} = 3 + a \geq 0$

$\Rightarrow \boxed{a \geq -3}$

So $\boxed{-3 \leq a \leq 1}$