Step-1

Big Formula

$$\det A = \sum_{all\ P's} \left(a_{1\alpha}a_{2\beta}...a_{n\omega}\right)\det P$$

By using big formula, we get

$$\det\left(a_{ij}\right)_{3\times3} = a_{11}a_{22}a_{33} + a_{12}a_{23}a_{31} + a_{13}a_{21}a_{32} - a_{12}a_{21}a_{33} - a_{11}a_{23}a_{32} - a_{13}a_{22}a_{31}$$

Step-2

a) If $a_{11} = a_{22} = a_{33} = 0$, four terms in the big formula are zeros.

They are $a_{11}a_{22}a_{33}, -a_{11}a_{23}a_{32}, -a_{12}a_{21}a_{33}, -a_{13}a_{22}a_{31}$

Step-3

b) If $a_{11} = a_{22} = a_{33} = a_{44} = 0$, then zero terms in the big formula are

$a_{11}a_{22}a_{33}a_{44}, a_{12}a_{21}a_{33}a_{44}, a_{11}a_{24}a_{33}a_{42}$
$a_{11}a_{22}a_{34}a_{43}, a_{11}a_{23}a_{32}a_{44}, a_{14}a_{22}a_{33}a_{41},$
$a_{13}a_{22}a_{31}a_{44}, a_{11}a_{23}a_{34}a_{42}, a_{11}a_{24}a_{32}a_{43},$
$a_{13}a_{22}a_{34}a_{41}, a_{14}a_{22}a_{31}a_{43}, a_{12}a_{24}a_{33}a_{41},$
$a_{14}a_{21}a_{33}a_{42}, a_{12}a_{23}a_{31}a_{44}, a_{13}a_{21}a_{32}a_{44}$

So, a total 15 terms vanish in the big formula.