20. Let A be a square matrix all of whose entries are integers. Then which one of the following is true ? (2008)

1) If $\det A = \pm 1$, then A^{-1} exists but all its entries are not necessarily integers.

2) If $\det A \neq \pm 1$, then A^{-1} exists and all its entries are non-integers.

3) If $\det A = \pm 1$, then A^{-1} exists and all its entries are integers.

4) If $\det A = \pm 1$, then A^{-1} need not exist.

Ans.

(3) Now $\det A = \pm 1$ and $A^{-1} = \dfrac{1}{\det(A)}(adjA)$

$\Rightarrow$ all entries in A^{-1} are integers