Step-1

Suppose A_n is the n by n tridiagonal matrix with 1s on the three diagonals:

$A_1 = [1]$, $A_2 = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$, $A_3 = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 1 \end{bmatrix}$, â€¦

Let D_n be the determinant of A_n.

Step-2

$A_4 = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 \end{bmatrix}$, the five terms are non zero in det A_4 are given by

$$a_{11}a_{22}a_{33}a_{44} - a_{12}a_{21}a_{33}a_{44} - a_{11}a_{22}a_{34}a_{43} + a_{12}a_{21}a_{34}a_{43} - a_{11}a_{23}a_{32}a_{44}$$

Step-3

Since $a_{11} = 1 = a_{12}, a_{21} = a_{22} = a_{23} = 1$

$a_{32} = a_{33} = a_{34} = 1, a_{43} = a_{44} = 1$

And remaining entries are zero.

Hence

$$\det A_4 = 1-1-1+1-1$$
$$\det A_4 \boxed{=-1}$$