Step-1

We need to show that each block J_i has only one row and one column and the entry is either 0 or 1 in it. We prove it by contradiction.

Let if possible, $J_i = \begin{bmatrix} \lambda & 1 & & & \\ & \lambda & 1 & & \\ & & & & \\ & & & \lambda & 1 \\ & & & & \lambda \end{bmatrix}$. The remaining entries are zeros.

Step-2

Therefore, we get

$$J_i^2 = \begin{bmatrix} \lambda & 1 & & & \\ & \lambda & 1 & & \\ & & & & \\ & & & \lambda & 1 \\ & & & & \lambda \end{bmatrix}\begin{bmatrix} \lambda & 1 & & & \\ & \lambda & 1 & & \\ & & & & \\ & & & \lambda & 1 \\ & & & & \lambda \end{bmatrix}$$

$$= \begin{bmatrix} \lambda^2 & 2\lambda & 1 & & \\ & \lambda^2 & 2\lambda & 1 & \\ & & & & \\ & & & \lambda^2 & 2\lambda \\ & & & & \lambda^2 \end{bmatrix}$$

Step-3

It is clear that $J^2 = J$ only when $\lambda^2 = \lambda$. Thus, $\lambda = 0 \text{ or } 1$. But then this will imply that $2\lambda \neq 1$. Also , there are extra 1 entries in the product.

Therefore, each block must be a 1 block and the entry o=in it should be either 0 or 1.