Step-1

Given matrix, $A=\begin{pmatrix}2&-1&-1\\-1&2&-1\\-1&-1&2\end{pmatrix}$

$|A_{11}|=2>0$

$|A_{22}|=\begin{vmatrix}2&-1\\-1&2\end{vmatrix}$

$=4-1$
$=3>0$

$|A_{33}|=|A|$

$=2(4-1)+1(-2-1)-(1+2)$

$=6-3-3$

$=0$

So A is not positive definite.

Step-2

Given matrix, $B=\begin{pmatrix}2&-1&-1\\-1&2&1\\-1&1&2\end{pmatrix}$

$|B_{11}|=2>0$

$|B_{22}|=\begin{vmatrix}2&-1\\-1&2\end{vmatrix}$

$=4-1$
$=3>0$

$|B_{33}|=|B|$

$=2(4-1)+1(-2+1)-(-1+2)$

$=6-1-1$

$= 4 > 0$

Thus $|B_{11}| > 0,\ |B_{22}| > 0,\ |B_{33}| > 0.$

Therefore, B $\boxed{\text{is positive definite}}$.

Step-3

Given matrix, $C = \begin{pmatrix} 0 & 1 & 2 \\ 1 & 0 & 1 \\ 2 & 1 & 0 \end{pmatrix}^2$

$$C = \begin{pmatrix} 0 & 1 & 2 \\ 1 & 0 & 1 \\ 2 & 1 & 0 \end{pmatrix}\begin{pmatrix} 0 & 1 & 2 \\ 1 & 0 & 1 \\ 2 & 1 & 0 \end{pmatrix}$$

$$= \begin{pmatrix} 5 & 2 & 1 \\ 2 & 2 & 2 \\ 1 & 2 & 5 \end{pmatrix}$$

Step-4

Now calculate determinant of left sub matrices

$|C_{11}| = 5 > 0$

$$|C_{22}| = \begin{vmatrix} 5 & 2 \\ 2 & 2 \end{vmatrix}$$
$$= 10 - 4$$
$$= 6 > 0$$

$$|C_{33}| = |C|$$
$$= 5(6) - 2(8) + 1(2)$$
$$= 30 - 16 + 2$$
$$= 16 > 0$$

Thus $|C_{11}| > 0,\ |C_{22}| > 0,\ |C_{33}| > 0.$

Therefore C $\boxed{\text{is positive definite}}$.