

$$(12) \text{ Given, } 3 \begin{bmatrix} x & y \\ z & w \end{bmatrix} = \begin{bmatrix} x & 6 \\ -1 & 2w \end{bmatrix} + \begin{bmatrix} 4 & x+y \\ 2+w & 3 \end{bmatrix}$$

find the values of x, y, z & w

Soln:-

$$3 \begin{bmatrix} x & y \\ z & w \end{bmatrix} = \begin{bmatrix} x & 6 \\ -1 & 2w \end{bmatrix} + \begin{bmatrix} 4 & x+y \\ 2+w & 3 \end{bmatrix}$$

$$\Rightarrow \begin{bmatrix} 3x & 3y \\ 3z & 3w \end{bmatrix} = \begin{bmatrix} x+4 & 6+x+y \\ -1+z+w & 2w+3 \end{bmatrix}$$

→ Comparing the corresponding elements of these two matrices, we get,

$$\Rightarrow 3x = x+4$$

$$\Rightarrow 2x = 4$$

$$\Rightarrow x = 2$$

$$3y = 6+x+y$$

$$\Rightarrow 2y = 6+x$$

$$\Rightarrow 2y = 6+2$$

$$\Rightarrow 2y = 8$$

$$\Rightarrow y = 4$$

$$3W = 2W + 3$$

$$W = 3$$

$$3Z = -1 + Z + W$$

$$\Rightarrow 2Z = -1 + W$$

$$\Rightarrow 2Z = -1 + 3$$

$$\Rightarrow 2Z = 2$$

$$\Rightarrow Z = 1$$

$$\therefore \left. \begin{array}{l} x = 2 \\ y = 4 \\ z = 1 \\ w = 3 \end{array} \right\}$$

Ans.