Step-1

(i)

Given system is

$u+v+w=6$

$u+2v+2w=11$

$2u+3v-4w=3$

We have to find the solution to this system by applying elimination.

Step-2

Given system can be written as

$$\begin{bmatrix} 1 & 1 & 1 & 6 \\ 1 & 2 & 2 & 11 \\ 2 & 3 & -4 & 3 \end{bmatrix}$$

apply $R_2 \to R_2 - R_1, R_3 \to R_3 - 2R_1$

$$\square \begin{bmatrix} 1 & 1 & 1 & 6 \\ 0 & 1 & 1 & 5 \\ 0 & 1 & -6 & -9 \end{bmatrix}$$

apply $R_3 \to R_3 - R_2$

$$\square \begin{bmatrix} 1 & 1 & 1 & 6 \\ 0 & 1 & 1 & 5 \\ 0 & 0 & -7 & -14 \end{bmatrix}$$

which is upper triangular form.

that is $u+v+w=6$

$v+w=5$

$-7w=-14$

Step-3

By back-ward substitution, we have

$-7w=-14$

$\Rightarrow \boxed{w=2}$

$v+w=5$

$\Rightarrow v+2=5$

$\Rightarrow \boxed{v\ =\ 3}$

$u+v+w=6$

$\Rightarrow u+3+2=6$

$\Rightarrow \boxed{u=1}$

Solutions are $\boxed{u=1, v=3, w=2}$

Step-4

(ii)

Given system is

$u+v+w=7$

$u+2v+2w=10$

$2u+3v-4w=3$

We have to find the solution to this system by applying elimination.

Step-5

Given system can be written as

$$\begin{bmatrix} 1 & 1 & 1 & 7 \\ 1 & 2 & 2 & 10 \\ 2 & 3 & -4 & 3 \end{bmatrix}$$

apply $R_2 \to R_2 - R_1, R_3 \to R_3 - 2R_1$

$$\square \begin{bmatrix} 1 & 1 & 1 & 7 \\ 0 & 1 & 1 & 3 \\ 0 & 1 & -6 & -11 \end{bmatrix}$$

apply $R_3 \to R_3 - R_2$

$$\square \begin{bmatrix} 1 & 1 & 1 & 7 \\ 0 & 1 & 1 & 3 \\ 0 & 0 & -7 & -11 \end{bmatrix}$$

which is upper triangular form.

that is $u+v+w=7$

$$v+w=3$$

$$-7w=-14$$

Step-6

By back-ward substitution, we have

$-7w=-14$

$\Rightarrow \boxed{w = 2}$

$v+w=3$

$\Rightarrow v+2=3$

$\Rightarrow \boxed{v=1}$

$u+v+w=7$

$\Rightarrow u+1+2=7$

$\Rightarrow \boxed{u=4}$

solution are $\boxed{u=4, v=1, w=2}$