Date: / /

NAME :- SULEMAN HAKEEM

SECTION :- B

ID :- 16757

Date: / /

16757

QUESTION:- 1

1:2:1 , 2 1 1 , 2:0:2

P	E
A	E

40

B_1

P	P
A	E

50

B_2

P	P
A	A

B_3

let x, y and p, z be the 108t/kg pak, Egyplcon, American cotton respectively than according to given condition

LA

$$\left.\begin{aligned} \frac{1}{4}x + \frac{2y}{4} + \frac{1}{4}z &= 40 \\ 2yx + \frac{1}{4}y + \frac{1}{4}z &= 50 \\ \frac{2x}{4} + \frac{2}{4} = z &= 60 \end{aligned}\right\} A.$$

$$\left.\begin{aligned} 1x + 2y + 1z &= 160 \\ 2x + 1y + 1z &= 200 \\ 1x + 1z &= 120 \end{aligned}\right\} B.$$

In matrix form we can write as:

$$\begin{bmatrix} 1 & 2 & 1 \\ 2 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} \begin{bmatrix} 160 \\ 200 \\ 120 \end{bmatrix}$$

Date: / /

16757

Let $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$, $x = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$, $B = \begin{bmatrix} 160 \\ 200 \\ 120 \end{bmatrix}$.

$\Rightarrow Ax = B$.

$A_1 = \begin{bmatrix} 160 & 2 & 1 \\ 200 & 1 & 1 \\ 120 & 0 & 1 \end{bmatrix}$ $A_2 \begin{bmatrix} 1 & 160 & 1 \\ 2 & 200 & 1 \\ 1 & 120 & 1 \end{bmatrix}$.

$A_3 \begin{bmatrix} 1 & 2 & 160 \\ 2 & 1 & 200 \\ 1 & 0 & 120 \end{bmatrix}$.

First $|A| \begin{vmatrix} 1 & 2 & 1 \\ 2 & 1 & 1 \\ 1 & 0 & 1 \end{vmatrix}$ expand By R_1

$= 1\begin{vmatrix} 1 & 1 \\ 0 & 1 \end{vmatrix} - 2\begin{vmatrix} 2 & 1 \\ 1 & 1 \end{vmatrix} + 1\begin{vmatrix} 2 & 1 \\ 1 & 0 \end{vmatrix}$

$= 1(1\times1 - 1\times0) - 2(2\times1 - 1\times1)$
$+ 1(2\times1 - 1\times1) = -2$

Now

$|A_1| = \begin{vmatrix} 160 & 2 & 1 \\ 200 & 1 & 1 \\ 120 & 0 & 1 \end{vmatrix}$ Expand By R_1

$= 1\begin{vmatrix} 1 & 1 \\ 0 & 1 \end{vmatrix} - 2\begin{vmatrix} 200 & 1 \\ 120 & 1 \end{vmatrix} + 1\begin{vmatrix} 200 & 1 \\ 120 & 0 \end{vmatrix}$

Date: / /

16757

$|A_1| = -120$

NOW

$$|A_2| = \begin{vmatrix} 1 & 160 & 1 \\ 2 & 200 & 1 \\ 1 & 120 & 1 \end{vmatrix}$$ Expand By R1.

$$\Rightarrow 1\begin{vmatrix} 200 & 1 \\ 120 & 1 \end{vmatrix} - 160\begin{vmatrix} 2 & 1 \\ 1 & 1 \end{vmatrix} + 1\begin{vmatrix} 2 & 200 \\ 1 & 120 \end{vmatrix}.$$

$|A_2| = -90.$

$$|A_3| = \begin{vmatrix} 1 & 2 & 160 \\ 2 & 1 & 200 \\ 1 & 0 & 120 \end{vmatrix}$$ Expand. by R1.

$$= 1\begin{vmatrix} 1 & 200 \\ 0 & 120 \end{vmatrix} - 2\begin{vmatrix} 2 & 200 \\ 1 & 120 \end{vmatrix} + 160.\begin{vmatrix} 2 & 1 \\ 1 & 0 \end{vmatrix}.$$

$= 1(120-0) - 2(240-200.) - 160(0-1)$

$|A_3| = -120.$

Now according to crammers.
rule:-

$$x = \frac{|A_1|}{A} = \frac{+\cancel{120}^{60}}{\cancel{-2}1} = 60$$

$$y = \frac{|A_2|}{|A_1|} = \frac{+\cancel{40}^{20}}{+\cancel{2}1} = 20$$

Babar Register

Date: / /

16757

$$z = \frac{|A_3|}{A_1} = \frac{-120}{-2} = 60$$

$(x, y, z) = (60, 20, 60)$

Pakistani: 60.

Egyption : 20

American: 60.

X ——— X ——— X ——— X ——— X ——— X