

9. (a) Three entrepreneurs R_1 , R_2 and R_3 sell seedlings of two species A and B. If the sales in one month and prices paid (in Tsh) for each type are $S = \begin{matrix} & A & B \\ R_1 & \begin{bmatrix} 12 & 13 \end{bmatrix} \\ R_2 & \begin{bmatrix} 8 & 5 \end{bmatrix} \\ R_3 & \begin{bmatrix} 16 & 9 \end{bmatrix} \end{matrix}$ and

$P = \begin{matrix} A \\ B \end{matrix} \begin{bmatrix} 2500 \\ 3500 \end{bmatrix}$ respectively, find the total sales for each of the three entrepreneurs.

- (b) Given matrix $A = \begin{bmatrix} 3 & -5 \\ 7 & -11 \end{bmatrix}$. Verify that $A^{-1}A = I$, where I is an identity matrix.

- (c) Use Cramer's rule to solve $\begin{cases} x + y + z = 6 \\ 2x + y - z = 1 \\ x - y + z = 2 \end{cases}$.

10. (a) Mention any four applications of linear programming.

- (b) Define the following terms in linear programming:

- (i) Objective function
- (ii) Constraints
- (iii) Feasible region

- (c) A special take away fast lunch of food and drinks contains 2 units of vitamin B and 5 units of iron. In each glass of drinks there are 4 units of vitamin B and 2 units of iron. A minimum of 8 units of vitamin B and 60 units of iron are served each day. If each serving of food cost 2000 Tshs and that of drinks cost 1600 Tshs; How much of the food and drinks are needed to be consumed in order to meet daily needs at a minimum cost?