Set A

3) $P_x = 150 - 3Q_x + 2Q_y$ Demand

$P_x = 30 + Q_x$ Supply

$Q_y = 20$ units

a) To find P_x and Q_x,

$P_x = 150 - 3Q_x + 2(20)$

$P_x = 190 - 3Q_x$

$190 - 3Q_x = 30 + Q_x$

$-4Q_x = -160$

$Q_x = 40$

$P_x = 190 - 3(40) = 70$

Old $P_x = 70$ Tk

New $P_x = 70 + 20 = 90$ Tk

$$XED = \frac{\%\ \Delta \text{ in } Q_y}{\%\ \Delta \text{ in } P_x}$$

$$= \frac{20}{\frac{90-70}{\left(\frac{90+70}{2}\right)}}$$

$$= \frac{20}{25}$$

$$= 0.8 \text{ (Ans.)}$$

b) X and Y are sweak substitutes since XED is positive and less than 1 (Ans.)

c) $P_x = 130 - 3Q_x + 2Q_y$

$= 130 - 3Q_x + 2(20)$

$= 170 - 3Q_x$

At equilibrium,

$170 - 3Q_x = 30 + Q_x$

$Q_x = 35$

Before income change, $Q_x = 40$

After " ", $Q_x = 35$

$$YED = \frac{\% \Delta \text{ in } Q_x}{\% \Delta \text{ in } Y}$$

$$= \frac{35 - 40}{\left(\frac{40+35}{2}\right)} \times 100$$

$$\frac{}{25}$$

$= -0,53$

d) Product X is an inferior good since YED is negative (Ans.)

SET B

$P_x = 210 - Q_x - Q_y$ Demand

$P_x = 45 + Q_x$ Supply

a) $Q_y = 30$

$$XED = \frac{\% \Delta \text{ in } Q_y}{\% \Delta \text{ in } P_x}$$

$$= \frac{45 - 30}{\left(\frac{45+30}{2}\right)}$$

$$\frac{}{15}$$

$$= \frac{40}{15} = 2.67 \text{ (Ans.)}$$

b) X and Y are close substitutes since XED is positive and greater than 1 (Ans.)

c) $P_x = 180 - 2Q_x - Q_y$

Before income change,

$P_x = 210 - 2Q_x - 30$

$= 180 - 2Q_x$

At equilibrium,

$180 - 2Q_x = 45 + Q_x$

$Q_x = 45$

After income change,

$P_x = 180 - 2Q_x - 30$

$= 150 - 2Q_x$

$150 - 2Q_x = 45 + Q_x$

$Q_x = 35$

$$YED = \frac{\% \Delta \text{in } Q_x}{\% \Delta \text{in } Y} = \frac{35 - 45}{\left(\frac{35+45}{2}\right)}$$

$$\frac{}{15}$$

$= \frac{-25}{15} = -1.67$

d) Product X is inferior good since YED is negative (Ans.)

Set C

a) $P_x = 210 - 2Q_x - Q_y$ Demand

$P_x = 45 + Q_x$ Supply

$Q_y = 30$

At equilibrium,

$210 - 2Q_x - 30 = 45 + Q_x$

$Q_x = 45$

$P_x = 45 + 45 = 90$ Tk

After increase in price,

$P_x = 90 + 10 = 100$ Tk

$$XED = \frac{\%\ \Delta \text{ in } Q_Y}{\%\ \Delta \text{ in } P_X}$$

$$= \frac{-15}{\frac{100-90}{\left(\frac{100+90}{2}\right)} \times 100}$$

$$= -1.425$$

b) X and Y are close complements since XED is negative and greater than 1. (Ans)

c) After income change,

$P_x = 180 - 2Q_x - Q_y$

$= 180 - 2Q_x - 30$

$= 150 - 2Q_x$

At equilibrium,

$150 - 2Q_x = 45 + Q_x$

$Q_x = 35$

$$YED = \frac{\% \Delta \text{ in } Q_x}{\% \Delta \text{ in } Y} = \frac{\frac{35 - 45}{\left(\frac{35+45}{2}\right)} \times 100}{-15}$$

$= 1.67$ (Ans.)

d) Product x is a normal good since YED is positive (Ans.)