Q14. Suppose there are two consumers in the market for a good and their demand functions are as follows: $d_1(p) = 20 - p$ for any price less than or equal to 20, and $d_1(p) = 0$ at any price greater than 20. $d_2(p) = 30 - 2p$ for any price less than or equal to 15 and $d_1(p) = 0$ at any price greater than 15. Find out the market demand function.

Ans:

$$d_1(p) = 20 - p \begin{cases} p \le 20 \\ p > 20 \end{cases}$$

$$d_2(p) = 30 - 2p \begin{cases} p \le 15 \\ p > 15 \end{cases}$$

For price less than Rs 15 $(p \le 15)$

Market demand for a good = $d_1(p) + d_2(p)$

= 20 – p + 30 – 2p

= 50 – 3p

For price more than Rs 15 but less than Rs 20 $(15 < p \le 20)$

Market demand = $d_1(p) + d_2(p)$

= 20 – p + 0 $(\because$ for p>15, $d_2(p) = 0)$

= 20 – p

For price more than 20 (p>20)

Market demand = $d_1(p) + d_2(p)$

= 0 + 0 $(\because$ for p>10, $d_1(p) = 0$, $d_2(p) = 0)$

= 0

Thus, market demand

= 50 – 3p if $p \le 15$

= 20 – p if $15 < p \le 20$

= 0 if p>20

Q15. Suppose there are 20 consumers for a good and they have identical demand functions:

d(p) = 10 – 3p for any price less than or equal to $\frac{10}{3}$ and $d_1(p)=0$ at any price greater than $\frac{10}{3}$.

What is the market demand function?

Ans: d(p) = 10 – 3p if $p \le \frac{10}{3}$

$d_1(p)=0$ if $p > \frac{10}{3}$

Market demand = Summation of demand of all the consumers in the market

For $price \le \frac{10}{3}$

Market demand = $20\sum d(p)$ (Since consumers have identical demand curve)

$= 20\times(10-3p)$

= 200 – 60p

For $price > \frac{10}{3}$

Market demand = $20\times d_1(p)$

$=20\times 0$

= 0

Market demand function = $200-60p \begin{cases} if\ \ p \le \frac{10}{3} \\ if\ \ p > \frac{10}{3} \end{cases}$

= 0

********** END **********