Index Numbers

Ques(1) From the following data calculate PIN for 2020 with 2010 as a base by

(I) Laspeyre's Method (II) Passche's method

(III) Fisher's Method (IV) Dorbish and Bowley's method

(V) Marshall-Edgeworth's Method ~~(VI) Walsch's method~~

Commodity	2010		2020	
	Price	Quantity	Price	Quantity
A	20	8	40	6
B	50	10	60	5
C	40	15	50	15
D	20	20	20	25

Solution: Calculation of Price Index Numbers

Commodity	Base year		Current year		p_0q_0	p_0q_1	p_1q_0	p_1q_1
	p_0	q_0	p_1	q_1				
A	20	8	40	6	160	120	320	240
B	50	10	60	5	500	250	600	300
C	40	15	50	15	600	600	750	750
D	20	20	20	25	400	500	400	500
					Σp_0q_0 = 1660	Σp_0q_1 = 1470	Σp_1q_0 = 2070	Σp_1q_1 = 1790

(I) Laspeyre's Price Index: $P_{01} = \frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100 = \frac{2070}{1660} \times 100$

$= 1.2469 \times 100 = 124.69$

(II) Passche's Price Index: $P_{01} = \frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100 = \frac{1790}{1470} \times 100$

$= 1.2176 \times 100 = 121.76$

(III) ~~Marshall-Edgeworth's~~ Fisher's Price Index:

$P_{01} = \sqrt{L \times P} = \sqrt{124.69 \times 121.76}$

$= 123.22$

(IV) Doobish and Bowley's Price Index: $P_{01} = \frac{L+P}{2}$

$= \frac{124.69 + 121.76}{2}$

$= 123.22$

(V) Marshall-Edgeworth's Price Index:

$P_{01} = \frac{\sum p_1(q_0+q_1)}{\sum p_0(q_0+q_1)} \times 100 = \frac{\sum p_1 q_0 + \sum p_1 q_1}{\sum p_0 q_0 + \sum p_0 q_1} \times 100$

$= \frac{2070 + 1790}{1660 + 1470} \times 100 = \frac{3860}{3130} \times 100 = 1.2332 \times 100$

$P_{01} = 123.32$

Ques (2) From the following data Calculate PIN by

(I) Laspoyre's Price Index (II) Passche's Price Index

(III) Fisher's Price Index (IV) Dorbish and Bowley's Price Index

(V) marshall-Edgeworth's Price Index

Commodity	Base year		current year	
	Price	Quantity	Price	Quantity
A	2	40	6	50
B	4	50	8	40
C	6	20	9	30
D	8	10	6	20
E	10	10	5	20