DATA INTERPRETATION-IV

LINE GRAPHS

Theory: The money spent by the company to manufacture the goods is called the investment or expenditure (E). The money that the company gets by selling the goods is called its income (I).

If I > E then the company gets a profit = I – E

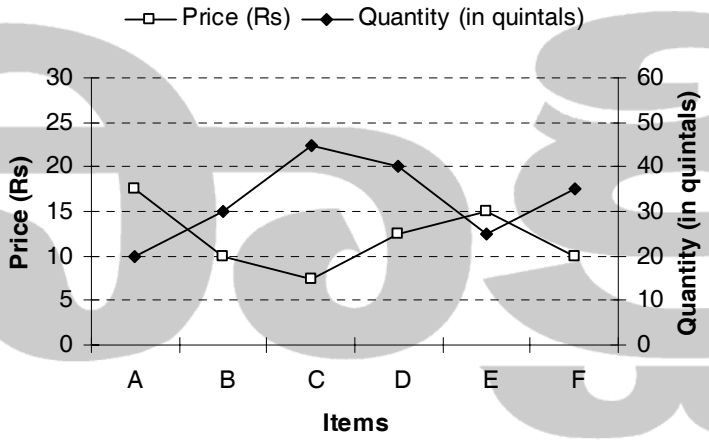
So the profit percent (P) is given by $P = \frac{Profit}{Expenditure} \times 100 = \frac{(I-E)}{E} \times 100$

$\Rightarrow \boxed{\frac{I}{E} = \frac{100+P}{100}}$

Use this formula while solving the questions from 6 to 10.

Directions (Q. 1-5): Study the following graph carefully to answer these questions.

Quantity of various items sold and price per kg



1. If the quantity sold of item D increased by 50% and the price reduced by 10%. What was the total value of the quantity sold for item D?

a) ` 675 b) ` 6,750 c) ` 67,550 d) ` 67,500 e) None of these

ANSWER: d

Quantity sold of item D after increase $= \left(\frac{100+50}{100}\right) \times 40 = \frac{150}{100} \times 40 = 60$

The price of item D after reduction $= \left(\frac{100-10}{100}\right) \times 12.5 = \frac{90}{100} \times 12.5 = 11.25$

$\therefore$ Total value of quantity sold of item D = 60 × 11.25 × 100 = ` 67500 ($\because$ 1 quintal = 100 kg)

SHORT CUT METHOD:

If the price of a product is changed by x% and the quantity sold by y% then the total value changes by $\left(x+y+\frac{xy}{100}\right)$%

Use (+) for increase and (–) for reduction

Here $x = -10$ $y = +50$ so total value changes by $\left(-10+50+\frac{50\times-10}{100}\right)$

= 35% (i.e. 35% increase)

Original total cost of item D as per graph = 40 × 12.5 × 100 = ` 50,000

After the above two changes total cost of item D sold

$$= \left(\frac{100+35}{100}\right)\times 50000 = \frac{135}{100}\times 50000 = \text{` } 67500$$

2. Approximately, what is the average price per kg of items A, B and C?

a) ` 9.50 b) ` 8 c) ` 7.50 d) ` 9 e) ` 10.50

ANSWER: e

Total quantity sold of items A, B and C = (20 + 30 + 45)×100 = 9500 kg

Total value of items A, B and C = 2000×17.5 + 3000×10 + 4500×7.5

= 35000 + 30000 + 33750 = 98750

∴ Average price $= \frac{98750}{9500} = \frac{987.5}{95} = 10.4 \cong 10.5$

3. What is the ratio between the total values of quantity sold for items E and F respectively?

a) 15 : 14 b) 3 : 2 c) 5 : 7 d) 7 : 5 e) None of these

ANSWER: a

Total value of quantity sold of item E = 2500×15

Total value of quantity sold of item F = 3500×10

∴ Required ratio $= \cancel{2500}^{5}\times\cancel{15}^{3} : \cancel{3500}^{7}\times\cancel{10}^{2}$

= 15 : 14

4. Total value of the quantity sold for item C is what per cent of the total value of the quantity sold for item E?

a) 111 b) 85 c) 90 d) 87.5 e) None of these

ANSWER: c

Total value of the quantity sold of item C = 45×7.5

Total value of the quantity sold of item E = 25×15

∴ Required Percentage $= \frac{\cancel{45}^{9}\times\cancel{7.5}^{1}}{\cancel{25}_{5}\times\cancel{15}_{2}}\times 100 = 90$

5. If the price as well as the quantity sold is increased by 20% for item A, what is the total value of quantity sold for item A?

a) ` 48,500 b) ` 49,000 c) ` 42,000 d) ` 50,400 e) None of these

ANSWER: d

Apply the short-cut method discussed in Q. no. 1

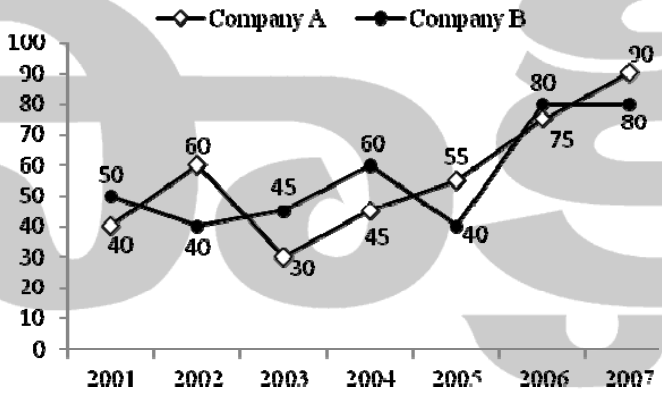
Then $x = 20$ $y = 20$ ∴ total value increases by $\left(20 + 20 + \frac{20 \times 20}{100}\right)\%$

Total value of the original quantity sold of item A = 2000×17.5 = ` 35000

∴ After increase the total value will be $\left(\frac{100 + 44}{100}\right) \times 35000 = \frac{144}{100} \times 35000$ = ` 50400

Directions (Q. 6-10): Study the following graph carefully and answer the questions given below it.

Per cent profit earned by two companies A and B over the years 2001 to 2007



6. Investment of company 'B' in 2007 is more by 40% than that in the previous year. Income in 2007 was what per cent of the investment in 2006?

a) 280% b) 252% c) 242% d) 52% e) None of these

ANSWER: b

Expenditure (E_{06}) of B in 2006 be `100 then its expenditure ($E_{07}$) in 2007 will be ` 140.

∴ For 2007, $\frac{I_{07}}{140} = \frac{100 + 80}{100}$

$\Rightarrow I_{07} = \frac{180}{100} \times 140 = 252$

∴ Required percentage = $\frac{I_{07}}{E_{06}} \times 100$

$= \frac{252}{100} \times 100 = 252$

7. Average investment of company 'A' over the years was ` 26 lakhs. What was its average income over the years?
a) ` 40.56 lakhs b) ` 41.60 lakhs c) ` 50.26 lakhs d) Data inadequate e) None of these

ANSWER: d
Since the average investment of A is given, its total investment for all the years can be found but not the investment of each year. As long as the investment of each year is unknown, the income of each year and so total income for all the years cannot be found.

Note: If the average/total investment (or income) is given then the average/total income (or investment) can be found if and only if the percentage profit remains the same for all those years.

For E.g. If the average/total investment (or income) of company B for 2002 and 2005 is given then the average/total income (or investment) can be found as the percent profit is same in both the years.

8. Income of company 'A' in 2005 was ` 21.7 lakhs. What was the investment?
a) ` 14.5 lakhs b) ` 15.4 lakhs c) ` 15.8 lakhs d) ` 14.6 lakhs e) None of these

ANSWER: e
For A: $I_{05} = 21.7$ $P_{05} = 55$ $E_{05} = ?$

But $\frac{I_{05}}{E_{05}} = \frac{100 + P_{05}}{100}$

$\therefore E_{05} = I_{05}\left(\frac{100}{100 + P_{05}}\right) = \frac{\cancel{21}^{.7} \times \cancel{100}^{20}}{\cancel{155}_{31}} = 14$

9. Income of company 'A' in 2005 is equal to the investment of the company 'B' in 2006. What is the ratio of the investment of company 'A' in 2005 to the investment of company 'B' in 2006?
a) 31 : 36 b) 31 : 20 c) 20 : 31 d) Data inadequate e) None of these

ANSWER: c
Investment of A in 2005 (E_{A05}) be 100

Then its income in 2005 (I_{A05}) = $\left(\frac{100 + P_{A05}}{100}\right) \times E_{A05} = \frac{155}{100} \times 100 = 155$

$\therefore$ Investment of B in 2006 (E_{B06}) = Income of A in 2005 (I_{A05}) = 155
$\therefore$ Required ratio = 100 : 155 = 20 : 31

10. Investment of company 'B' in 2003 was ` 1540000. What was its income in that year?

a) ` 23.33 lakhs b) ` 22.33 lakhs c) ` 22.23 lakhs d) ` 23.23 lakhs e) None of these

ANSWER: b

E_{B03} = 1540000 = 15.4 lakhs P_{B03} = 45 I_{B03} = ?

$\therefore \frac{I_{B03}}{E_{B03}} = \left(\frac{100 + P_{B03}}{100}\right)$

$\Rightarrow I_{B03} = \left(\frac{100 + 45}{100}\right) \times 15.4 = \frac{\cancel{145}^{29}}{\cancel{100}_{\cancel{20}_{10}}} \times \cancel{15.4}^{7.7} = 22.33$ lakhs