**LINE CHARTS**

**Solutions Exercise – Easy**

**Solutions for 1 − 3:**

1. (c)

4 and 2

2. (d)

5

3. (d)

Egg and onion.

**Solutions for 4 − 7:**

4. (a)

From the graph, we know the percentage growth in sales are:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Previous sales** | **Current sales** | **Difference** | **Percentage** |
| 1995-96 | 100 | 250 | 150 | 150% |
| 1996-97 | 250 | 300 | 50 | 20% |
| 1997-98 | 300 | 290 | − 10 | − 3.33% |
| 1998-99 | 290 | 680 | 390 | 134.5% |

It is but obvious from the above table that the maximum

percentage increase relative to previous year occurred in 1995-96.

5. (d)

From the graph, we can again calculate the growth in

profits.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Previous Profit** | **Current Profit** | **Difference** | **Percentage** |
| 1995-96 | 2.5 | 4.5 | 2 | 80% |
| 1996-97 | 4.5 | 6 | 1.5 | 33.33% |
| 1997-98 | 6.0 | 8.5 | 2.5 | 41.66% |
| 1998-99 | 8.5 | 12 | 3.5 | 41.2% |

The highest percentage growth in net profit relative to the previous year was achieved in 1995-96.

6. (b)

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Net profit** | **Net sales** | **Ratio** |
| 1994-95 | 2.5 | 100 | 0.025 |
| 1995-96 | 4.5 | 250 | 0.02 |
| 1996-97 | 6 | 300 | 0.02 |
| 1997-98 | 8.5 | 290 | 0.03 |
| 1998-99 | 12 | 680 | 0.018 |

The profitability is maximum for 1997-98.

7. (d)

It may be seen that profitability does not follow a fixed

pattern as the first three statements try to generalize the profitability. They are not applicable.

**Solutions for 8 − 11:**

8. (c)

All the years where ratio is more than 1, the imports will be more than exports.

9. (c)

In 2007 for Brij Exports



If Exports = *x* ; Imports = 2*x*

After increase exports = 1.4*x*

New ratio = 

10. (b)

In 2008 for Shiv Naresh



Exports = 

11. (a)

Brij in 2005

Imports = 2 × 540 = 1080 million

Imports of Shiv Naresh in 2008 = 

Exports of Shive in 2008 = 

Difference = 540 − 360 = 180 million.

**Solutions for 12 − 15:**

12. (b)

Required ratio = 

= 0.554 = 

13. (b)

Required ratio

= (22 × 1.25 × 1.3 × 1.2) : (13 × 1.1 × 1.2 × 1.2) :

(7 × 1.2 × 1.3 × 1.1) : (13 × 1.2 × 1.1 × 1.1)

= (22 × 1.25 × 1.3) : (13 × 1.1 × 1.2) :

(7 × 1.1 × 1.3) : (13 × 1.1 × 1.1)

= (22 × 1.25) : (10 × 1.1 × 1.2) : (7 × 1.1) :

(10 × 1.1 × 1.1)

= (20 × 1.25) : (10 × 1.2) : (7) : (10 × 1.1)

= 25 : 12 : 7 : 11

14. (b)

Required ratio = 

15. (c)

Birth rate at end of Y6 = 156 × 1.3 × 1.2 × 1.1 × 1.1

= 294.46

**Solutions for 16 − 18:**

16. (b)

The number of luxury cars become 3.5 times in 2011.

17. (a)

Percentage of mid segment cars = 

18. (d)

The luxury car for 63.29% of total cars in 2014, the highest for any year.

**Solutions Exercise – Medium**

**Solutions for 1 − 6:**

1. (a)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Male population** | **Female population** | **Total** | **Per capita production** |
| 1990 | 34 | 36 | 70 |  |
| 1992 | 35 | 37 | 72 |  |
| 1994 | 39 | 37 | 76 |  |
| 1996 | 43 | 40 | 83 |  |

From the table, it is clear that in 1990, the per capita

production of milk was least.

2. (d)

We can prepare a similar kind of table, that we prepared

for previous question. This table prepared is for food

grains.

|  |  |  |
| --- | --- | --- |
| **Year** | **Total population** | **Per capita production** |
| 1992 | 72 |  |
| 1993 | 74 |  |
| 1994 | 76 |  |
| 1995 | 80 |  |

Hence, per capita production of foodgrains was maximum in 1995.

3. (c)

Percentage increase in production of food

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Prod.**  **of**  **foodgrains** | **% increase** | **Prod.**  **of milk** | **% increase = Y** | **X** − **Y** |
| 1992 | 20 |  | 7 |  |  |
| 1993 | 22 |  | 8 |  | − 4.28% |
| 1994 | 25 |  | 7.5 |  | 19.8% |
| 1995 | 31 |  | 6.8 |  | 33.3% |
| 1996 | 23 |  | 7 |  | 31% |

From the last table, it is clear that in 1995, the difference

between percentage increase in production of foodgrains and percentage increase in production of milk was maximum.

4. (c)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Per capita consumption = A** | **Calories consumed = X(X = 320 ×** A**)** | **Per capita consumption of foodgrains = B** | **Calories consumed = Y(Y = 160 ×** B**)** | **X** + **Y** |
| 1993 | 0.11 | 35.2 | 0.28 | 44.8 | 80 |
| 1994 | 0.1 | 32 | 0.33 | 52.8 | 84.8 |
| 1995 | 0.093 | 29.76 | 0.37 | 59.2 | 88.96 |
| 1996 | 0.08 | 25.6 | 0.33 | 52.8 | 78.4 |

From the last column of the table, it is clear that the per

capita consumption of calories was highest in 1995.

5. (c)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Prod. of milk = A** | **Availability of nutrient = 120A = X** | **Prod. of foodgrains = B** | **Availability of nutrient = 60B = Y** | **X** + **Y** |
| 1993 | 8 | 960 | 22 | 1320 | 2280 |
| 1994 | 7.5 | 900 | 25 | 1500 | 2400 |
| 1995 | 6.8 | 816 | 32 | 1920 | 2736 |
| 1996 | 7 | 840 | 23 | 1380 | 2220 |

Clearly, from the table, availability of nutrient is maximum in 1995.

6. (c)

|  |  |  |
| --- | --- | --- |
| **Year** | **Total population** | **Per capita consumption of nutrient** |
| 1993 | 74 |  |
| 1994 | 76 |  |
| 1995 | 80 |  |
| 1996 | 83 |  |

From the table, it is clear that the per capita consumption is maximum in 1995.

**Solutions for 7 − 10:**

7. (a)

TCS (buy in M1) = 

Infosys (buy in M1) = 

IOCL (buy in M1) = 

Infosys (buy in M4) = 

8. (d)

Sell IOCl in M4 = 

Sell Maruti in M4 = 

Sell TCS in M2 = 

Sell Infosys in M3 = 

9. (b)

It can be directly inferred from the graph.

10. (d)

Average = 

= 1415

**Solutions for 11 − 15:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Alto K 10** | | | **Wagon R** | | | **Total Profit** |
| **Income** | **Expenditure** | **Profit** | **Income** | **Expenditure** | **Profit** |
| 2004 | 300 | 150 | 150 | 500 | 250 | 250 | 400 |
| 2005 | 400 | 250 | 150 | 600 | 200 | 400 | 550 |
| 2006 | 500 | 200 | 300 | 400 | 250 | 150 | 450 |
| 2007 | 400 | 150 | 250 | 600 | 150 | 450 | 700 |
| 2008 | 500 | 250 | 250 | 500 | 200 | 300 | 550 |
| 2009 | 600 | 150 | 450 | 700 | 100 | 600 | 1050 |
| 2010 | 400 | 200 | 200 | 600 | 150 | 450 | 650 |
| 2011 | 300 | 250 | 50 | 500 | 250 | 250 | 300 |
| 2012 | 500 | 200 | 300 | 600 | 300 | 300 | 600 |
| 2013 | 400 | 300 | 100 | 400 | 200 | 200 | 300 |

11. (b)

12. (c)

In 2012, the total profit became double over the last year.

13. (d)

Increase of 66.66%.

14. (c)

In the years 2005, 2007 and 2009.

15. (b)

In 2006 it decreased by 250,000 crores.

**Solutions for 16 − 19:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year | Coffee | | | Tea | | |
| Area under cultivation (000 sq. km) | Production (million tonnes) | Yeild (tonnes/sq. km) | Area under cultivation (000 sq. km) | Production (million tonnes) | Yeild (tonnes/sq. km) |
| 2008 | 5000 | 630 | 126 | 6500 | 910 | 140 |
| 2009 | 5500 | 660 | 120 | 6750 | 973.75 | 144.26 |
| 2010 | 5750 | 690 | 120 | 7000 | 1120 | 160 |
| 2011 | 6250 | 737.5 | 118 | 7250 | 1305 | 180 |
| 2012 | 6500 | 806 | 124 | 7562.5 | 1512.5 | 200 |
| 2013 | 6750 | 843.75 | 125 | 8000 | 1608 | 201 |

16. (d)

The lowest increase is shown in 2013 with increase of 1 only.

17. (c)

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Total Area (in 000 sq. km)** | **Total Cultivation (million tonnes** | **Total Yield (tonnes/sq. km)** |
| 2008 | 11500 | 1540 | 133.91 |
| 2009 | 12250 | 1633.75 | 133.36 |
| 2010 | 12750 | 1810 | 141.96 |
| 2011 | 13500 | 2042.5 | 151.29 |
| 2012 | 14062.5 | 2318.5 | 164.85 |
| 2013 | 14750 | 2451.75 | 166.22 |

18. (a)

Yield of coffee (2010) = 120

Yield of Tea (2010) = 160

Yield average (2010) = 141.96

Area required = 

Area required =  = 4860520 sq. km.

Area to be put under tea

= 5750 × 1000 − 4860.52 × 1000 = 889480 sq. km.

19. (b)

Yield of coffee (2014)

=  = 154.49 tonnes per sq. km.

**Solutions Exercise – Difficult**

**Solutions for 1 − 5:**

1. (b)

Profit = Revenue – Variable Cost – Fixed Cost

= Revenue – (Variable Cost + Fixed Cost). If we consider (Fixed Cost + Variable cost) as total cost, then as long as the revenue is higher than the total cost, there is a profit. In case the revenue is less than the total cost there would be a loss. If we are to compile the data given in the question it would be as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Production** | **Fixed cost (Rs.)** | **Variable cost (Rs.)** | **Total cost (Rs.)** | **Revenue (Rs.)** | **Profit/loss (Rs.)** |
| 9 | 70 | 125 | 195 | 180 | − 15 |
| 10 | 70 | 130 | 200 | 200 | + 0 |
| 20 | 70 | 280 | 350 | 400 | + 50 |
| 30 | 70 | 420 | 490 | 600 | + 110 |
| 40 | 100 | 560 | 660 | 800 | + 140 |
| 50 | 100 | 700 | 800 | 1000 | + 200 |

Thus, we can say that at a production of 10 units, there is a profit of Rs. 10. Above 10 units there is always a profit and below 10 units there is loss.

Hence, to make sure there is no loss, one has to manufacture a minimum of 10 units.

2. (a)

It can be seen that at 20 units there is a profit of Rs. 50. Below this the profit will reduce. Hence, to ensure that the profit is at least Rs. 50, then 20 units have to be manufactured.

3. (b)

Let us verify for the given options.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Production** | **Fixed cost (Rs.)** | **Variable cost (Rs.)** | **Total cost (Rs.)** | **Revenue (Rs.)** | **Profit/loss (Rs.)** | **Profit/unit (Rs.)** |
| 25 | 70 | 350 | 420 | 500 | + 80 | 3.20 |
| 34 | 70 | 476 | 546 | 680 | + 134 | 3.94 |
| 35 | 100 | 490 | 590 | 700 | + 110 | 3.14 |
| 40 | 100 | 560 | 660 | 800 | + 140 | 3.50 |

Hence, we can see that to maximise profit per unit, we need to manufacture 34 units.

4. (b)

Extending the above table for 45 units, we get

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Production** | **Fixed cost (Rs.)** | **Variable cost (Rs.)** | **Total cost (Rs.)** | **Revenue (Rs.)** | **Profit/loss (Rs.)** | **Profit/unit (Rs.)** |
| 45 | 100 | 360 | 730 | 900 | + 170 | 3.77 |

Thus, it can be figured out that still he has to manufacture 34 units.

5. (b)

Referring to the table in question 1, we can see that

if the fixed cost increases by Rs. 40, the profit will reduce by Rs. 40. Hence, we can see that at 10 units he will make a loss of Rs. 30 and at 20 units he will make a profit of Rs. 10. Hence, the answer has to be between (b) and (c). Let us verify for them:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Production** | **Fixed cost (Rs.)** | **Variable cost (Rs.)** | **Total cost (Rs.)** | **Revenue (Rs.)** | **Profit/loss (Rs.)** |
| 15 | 110 | 210 | 320 | 300 | − 20 |
| 19 | 110 | 266 | 376 | 380 | + 4 |

Thus, we see that to make sure there is no loss, he has to manufacture 19 units.

**Solutions for 6 − 9:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **V1** | **V2** | **V3** | **V4** | **Total** |
| **T1** | 2 | 6 | 4 | 6 | 18 |
| **T2** | 6 | 4 | 8 | 10 | 28 |
| **T3** | 4 | 6 | 6 | 8 | 24 |
| **T4** | 2 | 8 | 4 | 8 | 22 |
| **Total** | 14 | 24 | 22 | 32 |  |

So, T4 → South Africa (from III)

T3 → Pakistan

from II, VI → Adelaide

Now,

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Adelaide** | **V2** | **V3** | **V4** |
| **T1** | 2 | 6 | 4 | 6 |
| **T2** | 6 | 4 | 8 | 10 |
| **Pakistan** | 4 | 6 | 6 | 8 |
| **South Africa** | 2 | 8 | 4 | 8 |

Either T1 or T2 is West Indies.

But if T1 is West Indies then (I) will be invalid so, T2 → West Indies and V4 → Hobart

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Adelaide | Hamilton/Perth | Hamilton/Perth | Hobart |
| India | 2 | 6 | 4 | 6 |
| West Indies | 6 | 4 | 8 | 10 |
| Pakistan | 4 | 6 | 6 | 8 |
| South Africa | 2 | 8 | 4 | 8 |

6. (b)

7. (d)

8. (c)

9. (a)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Adelaide | Hamilton | Perth | Hobart |
| India | 2 | 6 | 4 | 6 |
| West Indies | 6 | 4 | 8 | 10 |
| Pakistan | 4 | 6 | 6 | 8 |
| South Africa | 2 | 8 | 4 | 8 |

**Solutions for 10 − 12:**

10. (c)

**For 2012**

423.5 = × (93.1 + 297.85 + 133 + Bowling Death Overs)

⇒ Bowling Death Overs in 2012 = 323.05

For **2013**

325.15 = × (85.75 + 269.15 + 105.7 + Bowling

Death overs)

**⇒ Bowling Death Overs in 2013 = 189.7**

**% change =**  **=** − 41.27%

11. (d)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Overall** | **BTO** | **BTDO** | **BWO** | **BWDO** |
| **2010** | 396.9 | 152.25 | 245 | 294.7 | 101.6 |
| **2011** | 355.95 | 113.05 | 238.7 | 248.38 | 111.77 |
| **2012** | 423.5 | 93.1 | 297.85 | 333.15 | 122.95 |
| **2013** | 325.15 | 85.75 | 269.15 | 160.15 | 135.25 |

**BTO** → Batting Overall ; **BTDO** → Batting Death Overs

**BWO** → Bowling Overall ; **BWDO** → Bowling Death Overs

From the table it is clear that highest change is in Bowling Over all

12. (b)

% decrease 2010 to 2012 = 

% decrease 2011 to 2013 = 

Required ratio 39 : 24.

**Solutions for 13 − 15:**

13. (a)

Average production of Surf

= 

14. (d)

15. (d)

|  |  |
| --- | --- |
|  | **Ratio of Wheel to Surf** |
| **Y1** | 1 : 59.52 |
| **Y2** | 1 : 83.33 |
| **Y3** | 1 : 60.09 |
| **Y4** | 1 : 65.21 |
| **Y5** | 1 : 62.5 |

**Solutions for 16 − 21:**

16. (c)

Cost in shift operation = 800 + 1200 = Rs. 2,000

Variable cost for 40 units = Rs. 3,600

Approximate average unit cost for July

=  = Rs. 140.

17. (b)

The only change for change of production from 40 to

41 is the variable cost which is

Rs. (3730 – 3600) = Rs. 130.

18. (d)

The trend for MC is varying and is just the reverse

condition. Take some values and check.

19. (c)

Total sales revenue = Rs. (150 × 40) = Rs. 6,000

Total production cost = Rs. (3600 + 2000) = Rs. 5600.

So profit = Rs. 400.

20. (a)

Profit is highest when there is no second shift.

21. (d)

(a) and (b) are definitely not true as the case is the

inverse of that mentioned in (c). Take some values

and check.