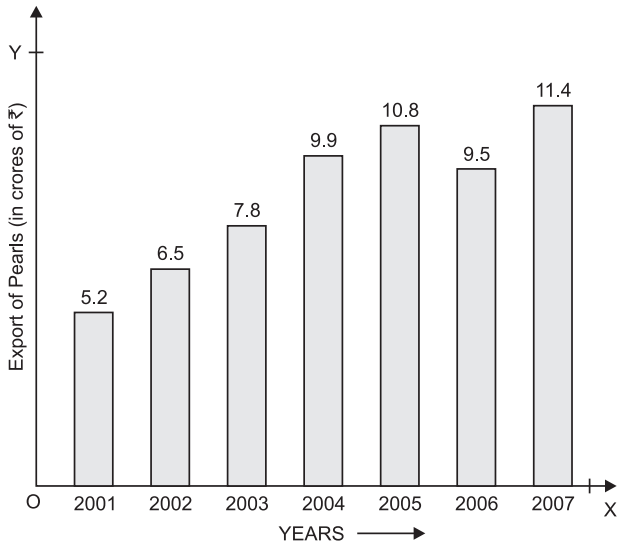
37 Bar Graphs

EXERCISE – I

Directions (*Questions 1–5*): *Study the following bar-graph carefully and answer the questions given below:*

(S.S.C., 2012)

Export of Pearls (in crores of rupees)



1. The average export of pearls for the given period (in crores ₹) was

(*a*) 8.7 (*b*) 8.73

(*c*) 9.73 (*d*) 8.85

2. In which year was there maximum percentage increase in export of pearls to that in the previous year?

(*a*) 2002 (*b*) 2007

(*c*) 2005 (*d*) 2004

3. In how many years was the export above average for the given period?

(*a*) 2 (*b*) 4

(*c*) 5 (*d*) 3

4. In which of the following pairs of years was the average export of pearls around ₹ 9 crores?

(*a*) 2002 and 2003 (*b*) 2003 and 2004

(*c*) 2004 and 2005 (*d*) 2005 and 2006

5. What was the percentage increase in export from 2006 to 2007?

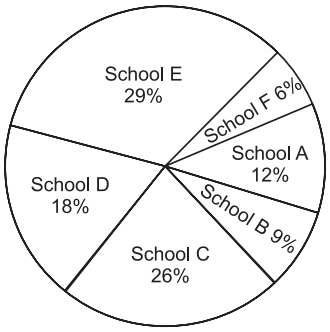
(*a*) $16\frac{2}{3}\%$ (*b*) 19%

(*c*) 20%t (*d*) $33\frac{1}{3}\%$

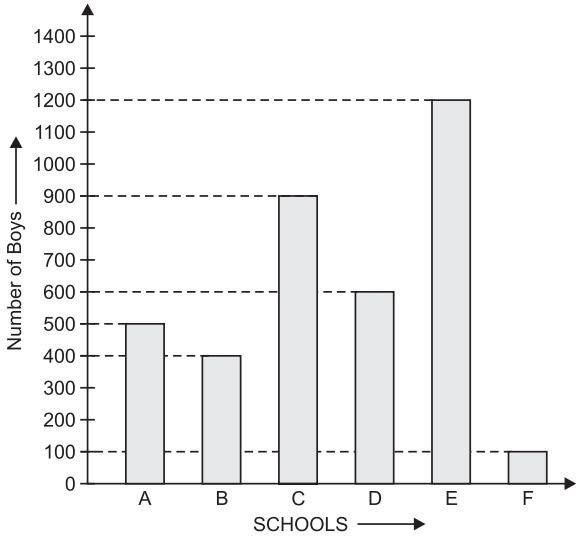
Directions (*Questions 6–10*): *Study the following pie-chart and bar diagram and answer the following questions*

(Bank P.O., 2011)

Percentage-wise Distribution of students in 6 Different Schools. Total number of students = 6000.



Number of Boys in Each School Out of 6000 Students



6. What is the sum of the number of girls in School C, the number of girls in School E and the number of boys in School D together ?

(*a*) 1700 (*b*) 1900

(*c*) 1600 (*d*) 1800

(*e*) None of these

7. What is the ratio of the number of boys in School C, the number of girls in School B and the total number of students in School E?

(*a*) 45 : 7 : 97 (*b*) 43 : 9 : 97

(*c*) 45 : 7 : 87 (*d*) 43 : 9 : 87

(*e*) None of these

8. What is the difference between the total number of students in School *F* and the number of boys in School *E* ?

(*a*) 820 (*b*) 860

(*c*) 880 (*d*) 900

(*e*) None of these

9. In which of the following schools is the total number of students equal to the number of girls in School E ?

(*a*) A (*b*) B

(*c*) C (*d*) D

(*e*) F

10. The number of girls in School A is approximately what percentage of the total number of students in School B ?

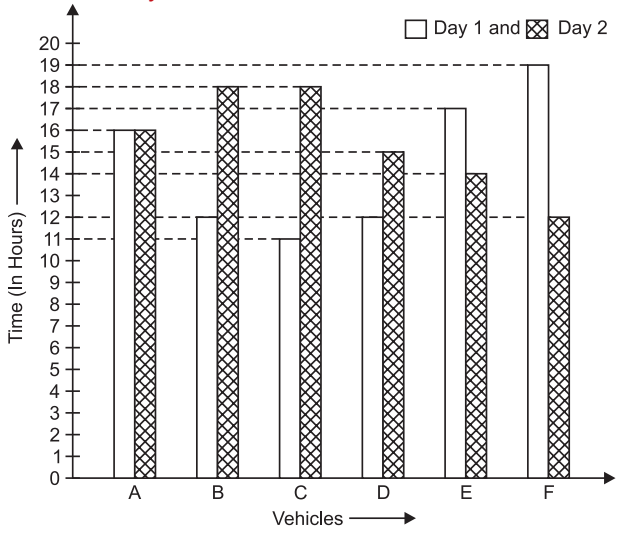
(*a*) 55 (*b*) 50

(*c*) 35 (*d*) 45

(*e*) 40

Directions (*Questions 11–15*): *Study the following bar graph and the table carefully and answer the questions given below:* **(Bank P.O., 2012)**

Time Taken (in Hours) by 6 Vehicles on Two Different Days



Distance Covered (in km) by 6 Vehicles on Each day

Vehicle	Day 1	Day 2
A	832	864
B	516	774
C	693	810
D	552	765
E	935	546
F	703	636

11. Which of the following vehicles travelled at the same speed on both the days?

(*a*) A (*b*) C

(*c*) F (*d*) B

(*e*) None of these

12. What was the difference between the speed of vehicle *A* on Day 1 and the speed of vehicle C on the same day?

(*a*) 7 km/hr (*b*) 12 km/hr

(*c*) 11 km/hr (*d*) 8 km/hr

(*e*) None of these

13. What was the speed of vehicle C on Day 2 in terms of metres per second?

(*a*) 15.3 (*b*) 12.8

(*c*) 11.5 (*d*) 13.8

(*e*) None of these

14. The distance travelled by vehicle *F* on Day 2 was approximately what per cent of the distance travelled by it on Day 1?

(*a*) 80% (*b*) 65%

(*c*) 85% (*d*) 95%

(*e*) 90%

15. What is the ratio of the speeds of vehicle *D* and vehicle *E* on Day 2?

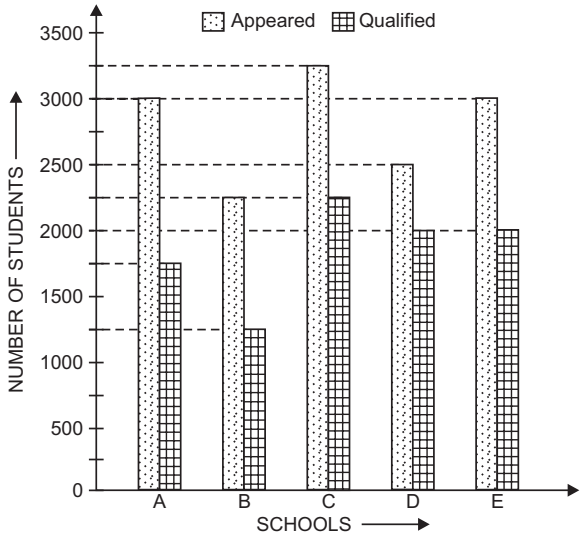
(*a*) 15 : 13 (*b*) 17 : 13

(*c*) 13 : 11 (*d*) 17 : 14

(*e*) None of these

Directions (*Questions 16–20*): *Study the following graph carefully and answer the questions given below:* **(Bank P.O., 2011)**

Total Number of Students Appeared and Qualified from Various Schools at a Scholarship Exam



16. The average number of students qualified in the examination from Schools C and D is what percent of the average number of students appeared for the examination from the same schools? (rounded off to 2 digits after decimal)

(*a*) 58.62 (*b*) 73.91

(*c*) 62.58 (*d*) 58.96

(*e*) None of these

17. What is the ratio of the number of students appeared to the number of students qualified at the scholarship exam from School C ?

(*a*) 7 : 12 (*b*) 6 : 5

(*c*) 9 : 13 (*d*) 9 : 10

(*e*) None of these

18. What is the ratio of the number of students qualified in the scholarship examination from School A and the number of students qualified in the examination from School B?

(*a*) 8 : 3 (*b*) 5 : 7

(*c*) 7 : 3 (*d*) 7 : 5

(*e*) None of these

19. The number of students appeared for the scholarship exam from School D is approximately what percent of the total number of students appeared for the exam from all the schools together ?

(*a*) 12 (*b*) 24

(*c*) 29 (*d*) 18

(*e*) 8

20. What is the difference between the average number of students appeared in the scholarship exam from all the given schools and the average number of students qualified from all the schools together?

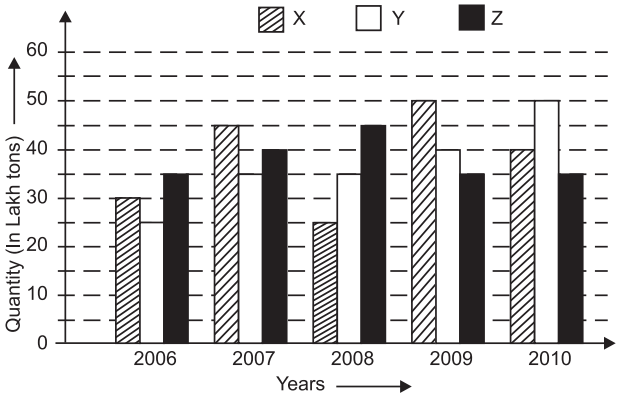
(*a*) 950 (*b*) 1100

(*c*) 990 (*d*) 1020

(*e*) None of these

Directions (*Questions 21–26*): ***The bar graph given below gives the data of the production of paper (in lakh tonnes) by three different companies X, Y and Z over last 5 years. Study the graph carefully and answer the questions that follow.***

Production of Paper (in lakh tons) By Companies X, Y and Z over the Years



21. What is the difference between the production of Company Z in 2008 and Company Y in 2006?

(*a*) 2 lakh tons (*b*) 20 lakh tons

(*c*) 20 thousand tons (*d*) 200 lakh tons

(*e*) None of these

22. What is the ratio of the average production of Company X during the period 2008-2010 to the average production of Company Y during the same period?

(*a*) 1 : 1 (*b*) 15 : 17

(*c*) 23 : 25 (*d*) 27 : 29

(*e*) None of these

23. What is the percentage increase in the production of Company Y from 2006 to 2009?

(*a*) 30% (*b*) 45%

(*c*) 50% (*d*) 60%

(*e*) 75%

24. The average production for 5 years was maximum for which company?

(*a*) X (*b*) Y

(*c*) Z (*d*) X and Y both

(*e*) X and Z both

25. For which of the following years, the percentage rise or fall in production from the previous year is the maximum for Company Y?

(*a*) 2007 (*b*) 2008

(*c*) 2009 (*d*) 2010

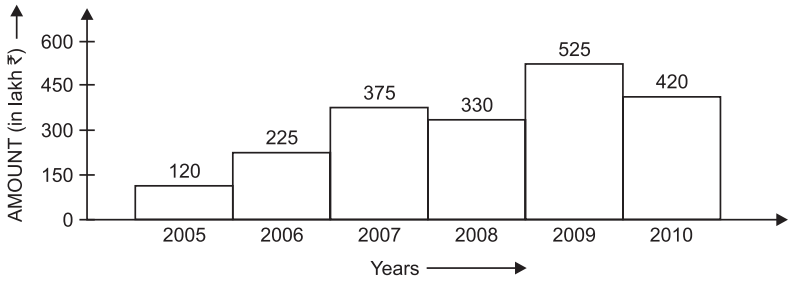
(*e*) 2007 and 2010

26. In which year was the percentage of production of Company Z to the production of Company Y, the maximum?

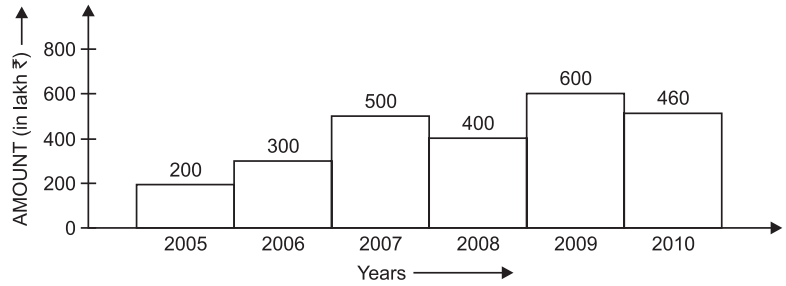
(*a*) 2006 (*b*) 2007
(*c*) 2008 (*d*) 2009
(*e*) 2010

Directions (*Questions 27–31*): *Out of the bar graphs given below, one shows the amount (in lakh ₹) invested by a company in purchasing raw materials over the years and the other shows the value (in lakh ₹) of finished goods sold by the company over the years. Study the bar graphs and answer the questions based on them.*

Amount Invested in Raw Materials (in Lakh ₹)



Value of Sales of Finishes Goods (in Lakh ₹)



27. In which years, there is maximum percentage increase in the amount invested in raw materials as compared to the previous year?

(*a*) 2006 (*b*) 2007
(*c*) 2008 (*d*) 2009
(*e*) 2010

28. In which year, the percentage change (compared to previous year) in the investment on raw materials is the same as that in the value of sales of finished goods?

(*a*) 2006 (*b*) 2007
(*c*) 2008 (*d*) 2009
(*e*) 2010

29. What was the difference between the average amount invested in raw materials during the given period and the average value of sales of finished goods during this period?

(*a*) ₹ 62.5 lakhs (*b*) ₹ 68.5 lakhs
(*c*) ₹ 71.5 lakhs (*d*) ₹ 77.5 lakhs
(*e*) ₹ 83.5 lakhs

30. The value of sales of finished goods in 2009 was approximately what percent of the average amount invested in raw materials in the years 2007, 2008 and 2009?

(*a*) 33% (*b*) 37%
(*c*) 45% (*d*) 49%
(*e*) 53%

31. The maximum difference between the amount invested in raw materials and the value of sales of finished goods was during the year

(*a*) 2005 (*b*) 2006
(*c*) 2007 (*d*) 2008
(*e*) 2009

ANSWERS

1. (*b*)	**2.** (*d*)	**3.** (*b*)	**4.** (*b*)	**5.** (*c*)	**6.** (*d*)	**7.** (*c*)	**8.** (*e*)	**9.** (*b*)	**10.** (*e*)
11. (*d*)	**12.** (*c*)	**13.** (*e*)	**14.** (*e*)	**15.** (*b*)	**16.** (*b*)	**17.** (*e*)	**18.** (*e*)	**19.** (*d*)	**20.** (*a*)
21. (*b*)	**22.** (*c*)	**23.** (*d*)	**24.** (*e*)	**25.** (*a*)	**28.** (*b*)	**29.** (*d*)	**30.** (*d*)	**31.** (*c*)	

SOLUTIONS

***Questions* (1–5):**

1. Average export of pearls over the period

$$= ₹\left\{\frac{1}{7}(5.2 + 6.5 + 7.8 + 9.9 + 10.8 + 9.5 + 11.4)\right\} \text{ crores}$$

$$= ₹\left(\frac{61.1}{7}\right) \text{ crores} = ₹\ (8.728) \text{ crores} = ₹\ 8.73 \text{ crores.}$$

2. Increase % in various years:

$$2002 \rightarrow \left\{\frac{(6.5 - 5.2)}{5.2} \times 100\right\}\% = \left(\frac{1.3}{5.2} \times 100\right)\%$$

$$= \left(\frac{13}{52} \times 100\right)\% = 25\%.$$

$$2003 \rightarrow \left\{\frac{(7.8 - 6.5)}{6.5} \times 100\right\}\% = \left(\frac{1.3}{6.5} \times 100\right)\%$$

$$= \left(\frac{13}{65} \times 100\right)\% = 20\%.$$

$$2004 \rightarrow \left\{\frac{(9.9 - 7.8)}{7.8} \times 100\right\}\% = \left(\frac{2.1}{7.8} \times 100\right)\%$$

$$= \left(\frac{21}{78} \times 100\right)\% = \frac{350}{13}\% = 26.9\%.$$

$$2005 \rightarrow \left\{\frac{(10.8 - 9.9)}{9.9} \times 100\right\}\% = \left(\frac{0.9}{9.9} \times 100\right)\%$$

$$= \left(\frac{9}{99} \times 100\right)\% = \frac{100}{9}\% = 11.1\%.$$

$$2007 \rightarrow \left\{\frac{(11.4 - 9.5)}{9.5} \times 100\right\}\% = \left(\frac{1.9}{9.5} \times 100\right)\%$$

$$= \left(\frac{19}{95} \times 100\right)\% = 20\%.$$

Clearly, the maximum increase was in 2004.

3. Average export during the given period = ₹ 8.73 crores.

It was above average in 2004, 05, 06 and 07, i.e. in 4 years.

4. Average export in 2003 and 2004

$$= ₹\ \frac{(7.8 + 9.9)}{2} \text{ crores}$$

$$= ₹\ \left(\frac{17.7}{2}\right) \text{ crores}$$

= ₹ 8.85 crores = ₹ 9 crores (nearly).

5. Percentage increase in export from 2006 to 2007

$$= \left\{\frac{(11.4 - 9.5)}{9.5} \times 100\right\}\% = \left(\frac{1.9}{9.5} \times 100\right)\%$$

$$= \left(\frac{19}{95} \times 100\right)\% = 20\%.$$

***Questions* (6–10):**

Number of students in:

$$A \rightarrow \left(\frac{12}{100} \times 6000\right) = 720; \quad B \rightarrow \left(\frac{9}{100} \times 6000\right) = 540;$$

$$C \rightarrow \left(\frac{26}{100} \times 6000\right) = 1560; \quad D \rightarrow \left(\frac{18}{100} \times 6000\right) = 1080;$$

$$E \rightarrow \left(\frac{29}{100} \times 6000\right) = 1740;$$

$$F \rightarrow \left(\frac{6}{100} \times 6000\right) = 360.$$

Number of boys in :

A → 500, B → 400, C → 900, D → 600,

E → 1200, F → 100.

Number of girls in:

A → (720 – 500) = 220; B → (540 – 400) = 140; C → (1560 – 900) = 660;

D → (1080 – 600) = 480; E → (1740 – 1200) = 540; F → (360 – 100) = 260.

6. Required sum = (660 + 540 + 600) = 1800.

7. Required ratio = 900 : 140 : 1740 = 90 : 14 : 174 = 45 : 7 : 87.

8. (Number of boys in E) – (Number of students in F) = (1200 – 100) = 1100.

9. Number of girls in School E = 540 = Total number of students in B.

10. Let (Number of girls in A) be x% of number of students in B. Then,

$$220 = \frac{x}{100} \times 540 \Rightarrow x = \left(\frac{220 \times 100}{540}\right)$$

$$= \frac{1100}{27} = 40.7 \simeq 40\% \text{ (nearly).}$$

***Questions* (11–15):**

Speeds of vehicles on Day 1:

$$A \rightarrow \frac{832}{16} \text{ km/hr} = 52 \text{ km/hr};$$

$$B \rightarrow \frac{516}{12} \text{ km/hr} = 43 \text{ km/hr};$$

$$C \rightarrow \frac{693}{11} \text{ km/hr} = 63 \text{ km/hr};$$

$$D \rightarrow \frac{552}{12} \text{ km/hr} = 46 \text{ km/hr};$$

$$E \rightarrow \frac{935}{17} \text{ km/hr} = 55 \text{ km/hr};$$

$$F \rightarrow \frac{703}{19} \text{ km/hr} = 37 \text{ km/hr.}$$

Speeds of vehicles on Day 2:

A $\rightarrow \frac{864}{16}$ km/hr = 54 km/hr;

B $\rightarrow \frac{774}{18}$ km/hr = 43 km/hr;

C $\rightarrow \frac{810}{18}$ km/hr = 45 km/hr;

D $\rightarrow \frac{765}{15}$ km/hr = 51 km/hr;

E $\rightarrow \frac{546}{14}$ km/hr = 39 km/hr;

F $\rightarrow \frac{636}{12}$ km/hr = 53 km/hr.

11. Clearly *B* travelled at the same speed on both the days.

12. Difference between the speed of A on Day 1 and speed of *C* on Day 1

= (63 – 52) km/hr = 11 km/hr.

13. Speed of C on Day 2 = 45 km/hr

$= \left(45 \times \frac{5}{18}\right)\text{m/sec} = \frac{25}{2}\text{ m/s} = 12.5\text{ m/s}.$

14. Required% $= \left(\frac{636}{703} \times 100\right)\% = \frac{63600}{703}\% = 90.46\% \simeq 90\%.$

15. Required ratio

$= \frac{\text{Speed of D on Day 2}}{\text{Speed of E on Day 2}} = \frac{51}{39} = \frac{17}{13} = 17:13.$

***Questions* (16–20):**

16. Average number of students qualified from C and D

$= \frac{1}{2}(2250 + 2000) = \frac{4250}{2} = 2125.$

Average number of students appeared from C and D

$= \frac{1}{2}(3250 + 2500) = \frac{5750}{2} = 2875.$

Required% $= \left(\frac{2125}{2875} \times 100\right)\% = \left(\frac{85}{115} \times 100\right)\%$

$= \left(\frac{1700}{23}\right)\% = 73.91\%.$

17. (Number of students appeared from C): (Number of students qualified from C) $= \frac{3250}{2250} = \frac{13}{9} = 13:9.$

18. (Number of students qualified from *A*): (Number of students qualified from B) $= \frac{1750}{1250} = \frac{7}{5} = 7:5.$

19. Required%

$= \left\{\frac{2500}{(3000 + 2250 + 3250 + 2500 + 3000)} \times 100\right\}\%$

$= \left(\frac{2500}{14000} \times 100\right)\% = \frac{125}{7}\% = 18\%\text{ (nearly)}.$

20. Average number of students appeared from all the schools

$= \frac{1}{5}(3000 + 2250 + 3250 + 2500 + 3000)$

$= \frac{14000}{5} = 2800.$

Average number of students qualified from all the schools

$= \frac{1}{5}(1750 + 1250 + 2250 + 2000 + 2000)$

$= \frac{9250}{5} = 1850.$

Required difference = (2800 – 1850) = 950.

***Questions* (21–26):**

21. Required difference

= (45 – 25) lakh tons = 20 lakh tons.

22. Average production of X during 2008 to 2010

$= \frac{1}{3} \times (25 + 50 + 40)\text{ lakh tons} = \left(\frac{115}{3}\right)\text{lakh tons}.$

Average production of Y during 2008 to 2010

$= \frac{1}{3} \times (35 + 40 + 50)\text{ lakh tons} = \left(\frac{125}{3}\right)\text{lakh tons}.$

$\therefore$ Required ratio $= \left(\frac{115}{3} \times \frac{3}{125}\right) = \frac{23}{25} = 23:25.$

23. Percentage increase in production of Y from 2006 to 2009

$= \left\{\frac{(40 - 25)}{25} \times 100\right\}\% = \left(\frac{15}{25} \times 100\right)\% = 60\%.$

24. Average production (in lakh tons) in 5 years for various companies are:

$X \rightarrow \frac{1}{5} \times (30 + 45 + 25 + 50 + 40) = \left(\frac{1}{5} \times 190\right) = 38;$

$Y \rightarrow \frac{1}{5} \times (25 + 35 + 35 + 40 + 50) = \left(\frac{1}{5} \times 185\right) = 37;$

$Z \rightarrow \frac{1}{5} \times (35 + 40 + 45 + 35 + 35) = \left(\frac{1}{5} \times 190\right) = 38.$

Clearly, it is maximum for *X* and *Z* both.

25. Percentage change (rise or fall) in production of *Y* in comparison to previous year, for different years is:

$2007 \rightarrow \left\{\frac{(35 - 25)}{25} \times 100\right\}\% = \left(\frac{10 \times 100}{25}\right)\% = 40\%;$

2008 $\rightarrow$ No change, i.e. 0%;

$2009 \rightarrow \left\{\frac{(40 - 35)}{35} \times 100\right\}\% = \left(\frac{5}{35} \times 100\right)\%$

$= \frac{100}{7}\% = 14.3\%;$

$2010 \rightarrow \left\{\frac{(50 - 40)}{40} \times 100\right\}\% = \left(\frac{10}{40} \times 100\right)\% = 25\%.$

So, it is maximum in 2007.

26. Percentage production of *Z* to production of *Y* in various years:

$2006 \rightarrow \left(\frac{35}{25} \times 100\right)\% = (35 \times 4)\% = 140\%;$

$2007 \rightarrow \left(\frac{40}{35} \times 100\right)\% = \frac{800}{7}\% = 114.3\%;$

$2008 \rightarrow \left(\frac{45}{35} \times 100\right)\% = \frac{900}{7}\% = 128.57\%;$

$2009 \rightarrow \left(\frac{35}{40}\times 100\right)\% = \frac{175}{2}\% = 87.5\%;$

$2010 \rightarrow \left(\frac{35}{50}\times 100\right)\% = 70\%.$

Clearly, this percentage was maximum in 2010.

***Questions* (27–31):**

27. The percentage increase in amount invested in raw-materials as compared to previous year for different years are:

$2006 \rightarrow \left\{\frac{(225-120)}{120}\times 100\right\}\% = \left(\frac{105}{120}\times 100\right)\% = \frac{175}{2}\%$

$= 87.5\%$

$2007 \rightarrow \left\{\frac{(375-225)}{225}\times 100\right\}\%$

$= \left(\frac{150}{225}\times 100\right)\% = \frac{200}{3}\% = 66.67\%;$

In 2008, there is a decrease.

$2009 \rightarrow \left\{\frac{(525-330)}{330}\times 100\right\}\%$

$= \left(\frac{195}{330}\times 100\right)\% = \frac{650}{11}\% = 59.09\%.$

In 2010, there is a decrease.

So, the maximum percentage increase in investment is in the year 2006.

28. The percentage change in the amount invested in raw-materials and in the value of sales of finished goods for different years are:

Year	Percentage change in Amount invested in raw-material	Percentage change in value of sales of finished goods
2006	$\left[\frac{(225-120)}{120}\times 100\right]\% = 87.5\%$	$\left[\frac{(300-200)}{200}\times 100\right]\% = 50\%$
2007	$\left[\frac{(375-225)}{225}\times 100\right]\% = 66.67\%$	$\left[\frac{(500-300)}{300}\times 100\right]\% = 66.67\%$
2008	$\left[\frac{(330-375)}{375}\times 100\right]\% - 12\%$	$\left[\frac{(400-500)}{500}\times 100\right]\% = -20\%$
2009	$\left[\frac{(525-330)}{330}\times 100\right]\% = 59.09\%$	$\left[\frac{(600-400)}{400}\times 100\right]\% = 50\%$
2010	$\left[\frac{(420-525)}{525}\times 100\right]\% = -20\%$	$\left[\frac{(460-600)}{600}\times 100\right]\% = -23.33\%.$

Thus, the percentage difference is same during the year 2007.

29. Required difference

$= \left[\begin{array}{l} ₹\left(\frac{200+300+500+400+600+460}{6}\right) \\ -₹\left(\frac{120+225+375+330+525+420}{6}\right)\end{array}\right]$ lakh

$= \left\{₹\left(\frac{2460}{6}\right) - ₹\left(\frac{1995}{6}\right)\right\}$ lakh

$= ₹\,(410 - 332.5)$ lakh $= ₹\,77.5$ lakh.

30. Required percentage

$= \left\{\frac{600}{(375+330+525)}\times 100\right\}\% = \left(\frac{600}{1230}\times 100\right)\%$

$= \left(\frac{2000}{41}\right)\% = 48.78\% \simeq 49\%.$

31. (Amount spent on Raw Material)

– (Value of sales of finished goods)

for various years are :

$2005 \rightarrow ₹\,(200 - 120)$ lakh $= ₹\,80$ lakh.

$2006 \rightarrow ₹\,(300 - 225)$ lakh $= ₹\,75$ lakh.

$2007 \rightarrow ₹\,(500 - 375)$ lakh $= ₹\,125$ lakh.

$2008 \rightarrow ₹\,(400 - 330)$ lakh $= ₹\,70$ lakh.

$2009 \rightarrow ₹\,(600 - 525)$ lakh $= ₹\,75$ lakh.

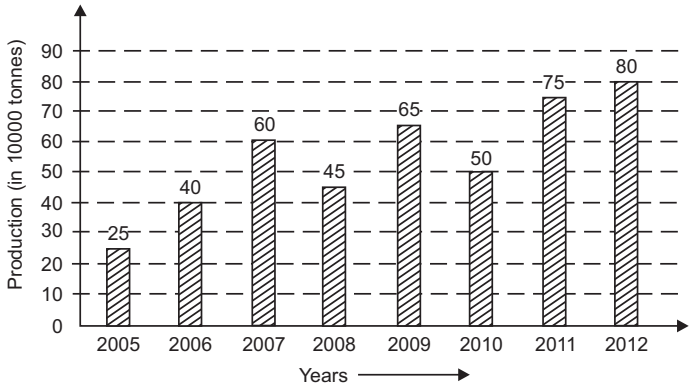
$2010 \rightarrow ₹\,(460 - 420)$ lakh $= ₹\,40$ lakh.

Clearly, the maximum difference was during the year 2007.

EXERCISE – II

Directions (*Questions* 1–5): *Study the following bargraph and answer the questions given below:*

Production of Fertilizers by a Company (in 10000 tonnes) Over the Years



1. In how many of the given years was the production of fertilizers more than the average production of the given years?

(*a*) 1 (*b*) 2
(*c*) 3 (*d*) 4
(*e*) 5

2. The average production of 2006 and 2007 was exactly equal to the average production of which of the following pairs of years?

(*a*) 2010 and 2011 (*b*) 2009 and 2010
(*c*) 2008 and 2010 (*d*) 2005 and 2009
(*e*) 2005 and 2011

3. What was the percentage decline in the production of fertilizers from 2007 to 2008?

(*a*) $33\frac{1}{3}\%$ (*b*) 30%
(*c*) 25% (*d*) 21%
(*e*) 20%

4. In which year was the percentage increase in production as compared to the previous year, the maximum?

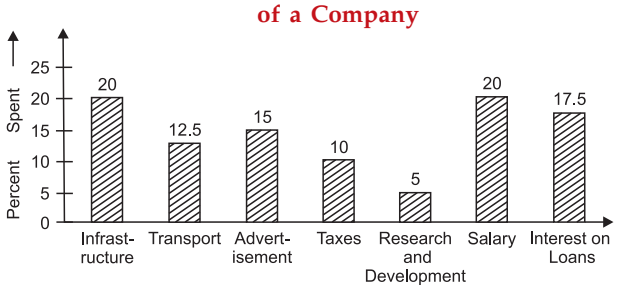
(*a*) 2012 (*b*) 2011
(*c*) 2009 (*d*) 2007
(*e*) 2006

5. What was the percentage increase in production of fertilizers in 2012 compared to that in 2005?

(*a*) 320% (*b*) 300%
(*c*) 220% (*d*) 200%
(*e*) 150%

Directions (*Questions* 6–10): *The bar graph given below shows the percentage distribution of total expenditure of a company under various expense heads during a year. Study the graph carefully and answer the questions that follow:*

Percentage Distribution of Total Expenditure of a Company



6. The expenditure on the Interest on Loans is by what percent more than the expenditure on Transport?

(*a*) 5% (*b*) 10%
(*c*) 20% (*d*) 30%
(*e*) 40%

7. What is the ratio of the total expenditure on Infrastructure and Transport to the total expenditure on Taxes and Interest on Loans?

(*a*) 5 : 4 (*b*) 8 : 7
(*c*) 9 : 7 (*d*) 13 : 11
(*e*) Cannot be determined

8. If the expenditure on Advertisement is ₹ 2.10 crores, then the difference between the expenditures on Transport and Taxes is:

(*a*) ₹ 1.25 crores (*b*) ₹ 95 lakhs
(*c*) ₹ 65 lakhs (*d*) ₹ 35 lakhs
(*e*) ₹ 25 lakhs

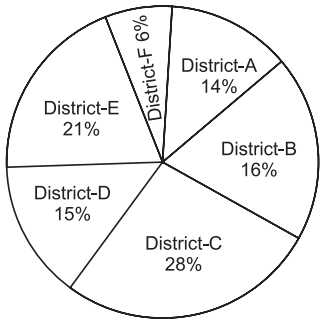
9. The total expenditure of the company is how many times the expediture on Research and Development?
(*a*) 27 (*b*) 20
(*c*) 18 (*d*) 8
(*e*) 5

10. If the Interest on Loans amounted to ₹ 2.45 crores, then the total expenditure on Advertisement, Taxes and Research and Development is:
(*a*) ₹ 7 crores (*b*) ₹ 5.4 crores
(*c*) ₹ 4.2 cores (*d*) ₹ 3 crores
(*e*) ₹ 2.4 crores

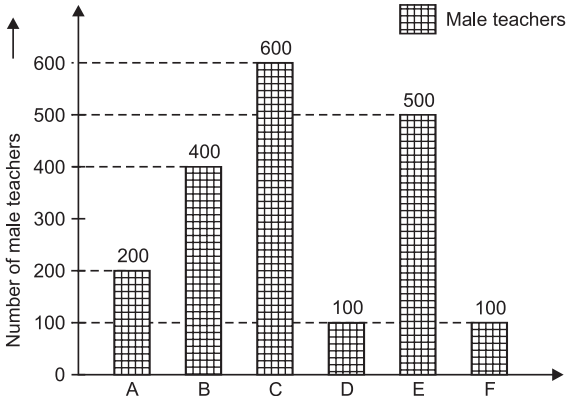
Directions (*Questions 11–15*): ***Study the following pie-chart and bar graph and answer the questions that follow:***

(Bank P.O. , 2011)

Percentage Wise Distribution of Teachers in 6 Districts



Number of Males In Each District Out of 4500 Teachers



11. What is the total number of male teachers in District F, female teachers in District C and female teachers in District B together?
(*a*) 1080 (*b*) 1120
(*c*) 1180 (*d*) 1020
(*e*) None of these

12. The number of female teachers in District D is approximately what per cent of the total number of teachers (both male & female) in District A?
(*a*) 70 (*b*) 75
(*c*) 80 (*d*) 95
(*e*) 90

13. In which district is the number of male teachers more than the number of female teachers?
(*a*) B only (*b*) D only
(*c*) Both B and E (*d*) Both E and F
(*e*) None of these

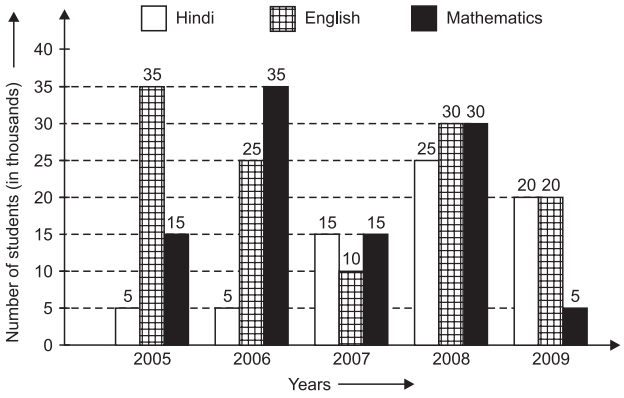
14. What is the difference between the number of female teachers in District F and the total number of teachers (both male and female) in District E?
(*a*) 625 (*b*) 775
(*c*) 675 (*d*) 725
(*e*) None of these

15. What is the ratio of the number of male teachers in District C to the number of female teachers in District *B*?
(*a*) 11 : 15 (*b*) 15 : 11
(*c*) 15 : 8 (*d*) 30 : 13
(*e*) None of these

Directions (*Questions 16–20*): *Study the following graph carefully and answer the questions that follow:*

(Bank P.O., 2011)

No. of Students (in thousands) who opted for Three Different Specializations during the Given Five Years in a University



16. Out of the total number of students who opted for the given three subjects in the year 2009, 38% were girls. How many boys opted for Mathematics in the same year?
(*a*) 1322 (*b*) 1332
(*c*) 1312 (*d*) Cannot be determined
(*e*) None of these

17. If the total number of students in the university in the year 2007 was 455030, the total number of students who opted for the given three subjects was approximately what percent of the total students?
(*a*) 19 (*b*) 9
(*c*) 12 (*d*) 5
(*e*) 23

18. What is the total number of students who opted for Hindi and Mathematics in the years 2006, 2007 and 2009 together?

(*a*) 97000 (*b*) 93000
(*c*) 85000 (*d*) 96000
(*e*) None of these

19. The total number of students who opted for Mathematics in the years 2005 and 2008 together is approximately what percent of the total number of students who opted for all three subjects in the same years?

(*a*) 38 (*b*) 28
(*c*) 42 (*d*) 32
(*e*) 48

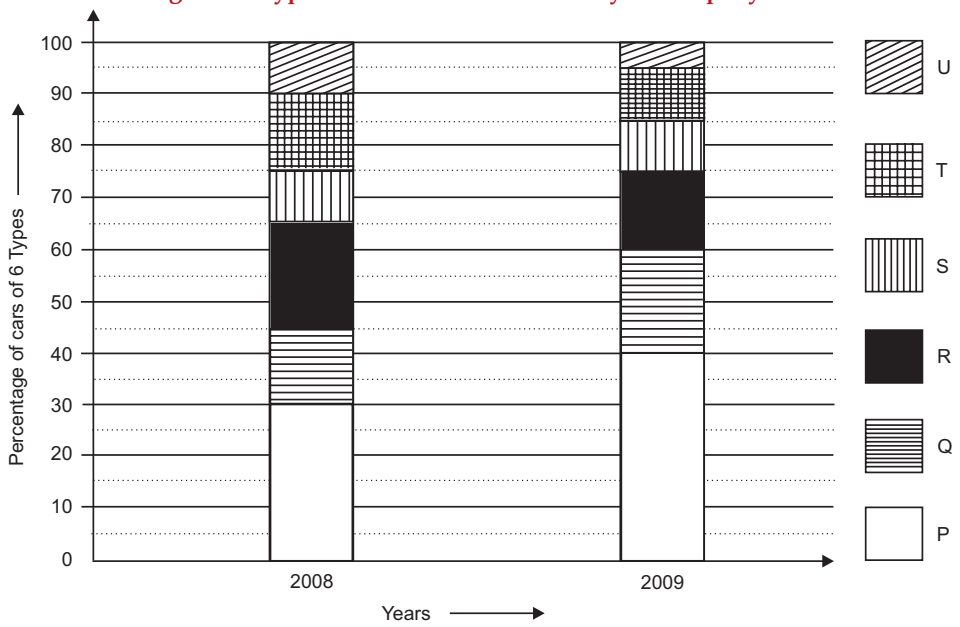
20. What is the ratio of the number of students who opted for English in the years 2006 and 2008 together to the number of students who opted for Hindi in the years 2005 and 2009 together?

(*a*) 11 : 5 (*b*) 12 : 7
(*c*) 11 : 7 (*d*) 12 : 5
(*e*) None of these

Directions (*Questions 21–25*): *The bar-graph given below shows the percentage distribution of the total production of a car manufacturing company into various models over two years. Study the graph carefully and answer the questions that follow.*

Total number of cars produced in 2008 = 350000.
Total Number of cars produced in 2009 = 440000.

Percentage of 6 Types of Cars Manufactured By a Company In 2008 & 2009



21. How many total cars of models P, Q and T were manufactured in the year 2008?

(*a*) 245000 (*b*) 227500
(*c*) 210000 (*d*) 192500
(*e*) 157500

22. For which model the percentage rise/fall in production was minimum from 2008 to 2009?

(*a*) Q (*b*) R
(*c*) S (*d*) T
(*e*) U

23. What was the difference in the number of *Q* type cars produced in 2008 and that produced in 2009?

(*a*) 35500 (*b*) 27000
(*c*) 22500 (*d*) 17500
(*e*) 16000

24. If the percentage production of *P* type cars in 2009 be the same as in 2008, then the number of *P* type cars produced in 2009 would have been:

(*a*) 140000 (*b*) 132000
(*c*) 117000 (*d*) 105000
(*e*) 97000

25. If 85% of the *S* type cars produced in each year were sold by the company, how many *S* type cars remained unsold?

(*a*) 7650 (*b*) 9350
(*c*) 11850 (*d*) 12250
(*e*) 13350

ANSWERS

1. (*d*)	**2.** (*e*)	**3.** (*c*)	**4.** (*e*)	**5.** (*c*)	**6.** (*e*)	**7.** (*d*)	**8.** (*d*)	**9.** (*b*)	**10.** (*c*)
11. (*a*)	**12.** (*e*)	**13.** (*c*)	**14.** (*b*)	**15.** (*c*)	**16.** (*d*)	**17.** (*b*)	**18.** (*e*)	**19.** (*d*)	**20.** (*a*)
21. (*c*)	**22.** (*b*)	**23.** (*a*)	**24.** (*b*)	**25.** (*c*)					

SOLUTIONS

***Questions* (1–5):**

1. Average production (in 10000 tonnes) over the given years

$$= \frac{(25+40+60+45+65+50+75+80)}{8}$$

$$= \frac{440}{8} = 55.$$

Clearly, the productions during 2007, 2009, 2011 and 2012 are more than the average production. These are 4 years.

2. Average production (in 10000 tonnes) during 2006 and 2007

$$= \frac{(40+60)}{2} = \frac{100}{2} = 50.$$

Average production (in 10000 tonnes) during:

$$(2010 \text{ and } 2011) \rightarrow \frac{(50+75)}{2} = \frac{125}{2} = 62.5;$$

$$(2009 \text{ and } 2010) \rightarrow \frac{(65+50)}{2} = \frac{115}{2} = 57.5;$$

$$(2008 \text{ and } 2010) \rightarrow \frac{(45+50)}{2} = \frac{95}{2} = 47.5;$$

$$(2005 \text{ and } 2009) \rightarrow \frac{(25+65)}{2} = \frac{90}{2} = 45;$$

$$(2005 \text{ and } 2011) \rightarrow \frac{(25+75)}{2} = \frac{100}{2} = 50.$$

$\therefore$ Average production of 2006 and 2007 = Average production of 2005 and 2011.

3. Decline percentage from 2007 to 2008

$$= \left\{\frac{(60-45)}{60} \times 100\right\}\% = \left(\frac{15}{60} \times 100\right)\% = 25\%.$$

4. Percentage increase in a year compared to previous year:

$$2006 \rightarrow \left\{\frac{(40-25)}{25} \times 100\right\}\% = \left(\frac{15}{25} \times 100\right)\% = 60\%;$$

$$2007 \rightarrow \left\{\frac{(60-40)}{40} \times 100\right\}\%$$

$$= \left(\frac{20}{40} \times 100\right)\% = 50\%;$$

In 2008, there is decrease in production.

$$2009 \rightarrow \left\{\frac{(65-45)}{45} \times 100\right\}\%$$

$$= \left(\frac{20}{45} \times 100\right)\% = \frac{400}{9}\% = 44.44\%;$$

In 2010, there is a decrease in production.

$$2011 \rightarrow \left\{\frac{(75-50)}{50} \times 100\right\}\% = \left(\frac{25}{50} \times 100\right)\% = 50\%;$$

$$2012 \rightarrow \left\{\frac{(80-75)}{75} \times 100\right\}\%$$

$$= \left(\frac{5}{75} \times 100\right)\% = \frac{20}{3}\% = 6.67\%.$$

Clearly, maximum percentage increase is in the year 2006.

5. Percentage increase in production in 2012 compared to 2005

$$= \left\{\frac{(80-25)}{25} \times 100\right\}\% = \left(\frac{55}{25} \times 100\right)\% = 220\%.$$

***Questions* (6–10):**

6. Let the total expenditure be ₹ x. Then,

Expenditure on Interest on Loans

$$= (17.5\% \text{ of } ₹\ x) = ₹\left(\frac{175x}{1000}\right).$$

Expenditure on Transport

$$= (12.5\% \text{ of } ₹\ x) = ₹\left(\frac{125x}{1000}\right).$$

$$\text{Difference} = ₹\left(\frac{175x}{1000} - \frac{125x}{1000}\right) = ₹\frac{(175x-125x)}{1000}$$

$$= ₹\frac{50x}{1000} = ₹\frac{x}{20}.$$

$\therefore$ Required% $= \left\{\frac{x}{20} \times \frac{1000}{125x} \times 100\right\}\% = 40\%.$

7. Let the total expenditure be ₹ x. Then

Total expenditure on Infrastructure and Transport

$$= \{(20 + 12.5)\% \text{ of } ₹\ x\}$$

$$= ₹\left(\frac{32.5 \times x}{100}\right) = ₹\left(\frac{325x}{1000}\right).$$

Total expenditure on Taxes and Interest on Loans

$$= \{(10 + 17.5)\% \text{ of } ₹\ x\}$$

$$= ₹\left(\frac{27.5 \times x}{100}\right) = ₹\left(\frac{275x}{1000}\right).$$

$\therefore$ Required ratio $= \frac{325x}{1000} : \frac{275x}{1000} = 13:11.$

8. Let the total expenditure be ₹x crores. Then

15% of x = 2.10

$$\Rightarrow \frac{15\times x}{100}=2.10 \Rightarrow 15x=(2.10\times 100)$$

$$\Rightarrow 15x = 210$$

$$\Rightarrow x = \frac{210}{15}=14.$$

$\therefore$ Total expenditure = ₹ 14 crores.

(Expenditure on Transport) – (Expenditure on Taxes)

$$= ₹\ \{(12.5 - 10)\% \text{ of } 14 \text{ crores}\}$$

$$= ₹\left(\frac{2.5}{100}\times 14\right)\text{crores}$$

$$= ₹\ \frac{35}{100}\text{crores}$$

$$= ₹\left(\frac{35}{100}\times 100 \text{ lakhs}\right)= ₹\ 35 \text{ lakh}.$$

9. Let the total expenditure (in crores) be ₹ x. Then,

Expenditure on Research & Development

$$= ₹(5\% \text{ of } x)$$

$$= ₹\ \frac{5x}{100}= ₹\frac{x}{20}.$$

(Total Expenditure): (Expenditure on Research and Development)

$$= x : \frac{x}{20}=20\ x : x = 20 : 1.$$

$\therefore$ Total Expenditure = 20 times the expenditure on Research & Development.

10. Let the total expenditure be ₹x crores.

Then, 17.5% of x = 2.45

$$\Rightarrow \frac{17.5x}{100}=2.45 \Rightarrow x=\frac{2.45\times 100}{17.5}=\frac{2450}{175}\Rightarrow x=14.$$

$\therefore$ Total expenditure = ₹ 14 crores.

Expenditure on Advertisement,

Taxes, Research and Development

$$= [(15 + 10 + 5)\% \text{ of } ₹\ 14 \text{ crores}]$$

$$= ₹\left(\frac{30}{100}\times 14\right)\text{crores}$$

$$= ₹\ 4.2 \text{ crores}.$$

***Questions* (11–15):**

Total number of teachers in :

$$A \rightarrow \left(\frac{14}{100}\times 4500\right)=630;$$

$$B \rightarrow \left(\frac{16}{100}\times 4500\right)=720;$$

$$C \rightarrow \left(\frac{28}{100}\times 4500\right)=1260;$$

$$D \rightarrow \left(\frac{15}{100}\times 4500\right)=675;$$

$$E \rightarrow \left(\frac{21}{100}\times 4500\right)=945;$$

$$F \rightarrow \left(\frac{6}{100}\times 4500\right)=270.$$

	A	*B*	*C*	*D*	*E*	*F*
Males	200	400	600	100	500	100
Females	430	320	660	575	445	170

11. Total number of male teachers in F, female teachers in *C* and female teachers in B

$$= (100 + 660 + 320) = 1080.$$

12. Female teachers in D = 575.

Total number of teachers in A

$$= (200 + 430) = 630.$$

Required percentage = $\left(\frac{575}{630}\times 100\right)\%$

$$=\frac{5750}{63}\% = 91.2\% \simeq 90\%.$$

13. Clearly, the number of male teachers is more than the number of female teachers in *B* and *E*.

14. Number of female teachers in *F* = 170

Total number of teachers in *E* = (500 + 445) = 945.

Required difference = (945 – 170) = 775.

15. Number of male teachers in C : Number of female teachers in B = 600 : 320 = 15 : 8.

***Questions* (16–20):**

16. Number of students who opted for the given three subjects in the year 2009 is (20000 + 20000 + 5000) = 45000.

Number of girls = 38% of 45000

$$= \left(45000\times\frac{38}{100}\right)=17100.$$

Out of these, the number of boys who opt for Mathematics cannot be found.

17. In 2007, we have :

Total number of students = 455030.

Number of those choosing the given three subjects = (15000 + 10000 + 15000) = 40000.

Required percentage = $\left(\frac{40000}{455030}\times 100\right)\%$

$$= 8.79\% \simeq 9\%.$$

18. Number of students who opt Hindi and Mathematics in 2006, 2007 and 2009.

$$= [(5 + 35) + (15 + 15) + (20 + 5)] \text{ thousands} = 95000.$$

19. Number of students opting Mathematics in 2005 and 2008 = (15000 + 30000) = 45000.

Number of students opting for these three subjects in 2005 and 2008

= [(5 + 35 + 15) + (25 + 30 + 30)] thousands

= (55000 + 85000) = 140000.

$\text{Required}\% = \left(\frac{45000}{140000} \times 100\right)\% = \frac{225}{7}\% = 32\%$ (nearly).

20. Ratio of the number who opted for English in 2006 and 2008 to the number who opted for Hindi in 2005 and 2009

= (25 + 30) : (5 + 20) = 55 : 25 = 11 : 5.

***Questions* (21–25):**

Number of cars of different models produced in 2008 out of 350000 :

P = 30% of 350000 = $\left(350000 \times \frac{30}{100}\right) = 105000$;

Q = (45 – 30)% of 350000 = $\left(350000 \times \frac{15}{100}\right) = 52500$;

R = (65 – 45)% of 350000 = $\left(350000 \times \frac{20}{100}\right) = 70000$;

S = (75 – 65)% of 350000 = $\left(350000 \times \frac{10}{100}\right) = 35000$;

T = (90 – 75)% of 35000 = $\left(350000 \times \frac{15}{100}\right) = 52500$;

U = (100 – 90)% of 350000 = $\left(350000 \times \frac{10}{100}\right) = 35000$.

Number of cars of different types produced in 2009 out of 440000:

P → (40% of 440000) = $\left(440000 \times \frac{40}{100}\right) = 176000$;

Q → (60 – 40)% of 440000 = $\left(440000 \times \frac{20}{100}\right) = 88000$;

R → (75 – 60)% of 440000 = $\left(440000 \times \frac{15}{100}\right) = 66000$;

S → (85 – 75)% of 440000 = $\left(440000 \times \frac{10}{100}\right) = 44000$;

T → (95 – 85)% of 440000 = $\left(440000 \times \frac{10}{100}\right) = 44000$;

U → (100 – 95)% of 440000 = $\left(440000 \times \frac{5}{100}\right) = 22000$.

21. Total number of cars of models *P*, *Q* and *T* produced in 2008

= (105000 + 52500 + 52500) = 210000.

22. Percentage change (rise or fall) in production from 2008 to 2009 is:

P → $\left\{\frac{(176 - 105)}{105} \times 100\right\}\%$

$= \left(\frac{71 \times 20}{21}\right)\% = \frac{1420}{21}\% = 67.6\%$ (Rise)

Q → $\left\{\frac{(88 - 52.5)}{52.5} \times 100\right\}\% = \left(\frac{355}{525} \times 100\right)\%$

$= \left(\frac{71 \times 20}{21}\right)\% = \frac{1420}{21}\% = 67.6\%$ (Rise)

R → $\left\{\frac{(70 - 66)}{70} \times 100\right\}\%$

$= \left(\frac{4}{70} \times 100\right)\% = \frac{40}{7}\% = 5.7\%$ (Fall)

S → $\left\{\frac{(44 - 35)}{35} \times 100\right\}\%$

$= \left(\frac{9 \times 100}{35}\right)\% = \frac{180}{7}\% = 25.7\%$ (Rise)

T → $\left\{\frac{(525 - 440)}{525} \times 100\right\}\% = \left(\frac{85 \times 100}{525}\right)\%$

$= \left(\frac{85 \times 4}{21}\right)\% = \frac{340}{21}\% = 16.2\%$ (Fall)

U → $\left\{\frac{(35 - 22)}{35} \times 100\right\}\% = \left(\frac{13 \times 100}{35}\right)\%$

$= \left(\frac{13 \times 20}{7}\right)\% = \frac{260}{7}\% = 37.1\%$ (Fall)

Clearly, minimum rise/fall percentage is in case of R.

23. Difference of production of Q in 2008 and 2009

= (88000 – 52500) = 35500.

24. Let the percentage production of P in 2009

= percentage production of *P* in 2008 = 30%.

Then, Production of P in 2009 = 30% of 440000

$= \left(\frac{30}{100} \times 440000\right) = 132000$.

25. Number of *S* type cars remained unsold in 2008 and 2009

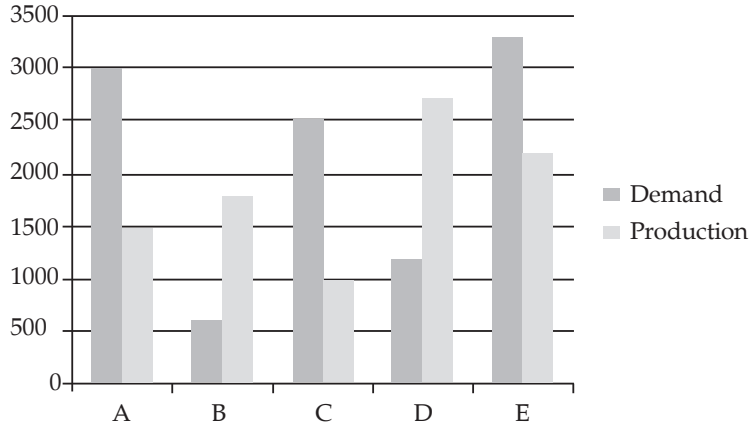
= 15% of 35000) + (15% of 44000)

$= \left(35000 \times \frac{15}{100}\right) + \left(44000 \times \frac{15}{100}\right)$

= (5250 + 6600) = 11850.

EXERCISE – III

Directions (*Questions* 1–5): *The following chart represents Demand and Production for 5 companies ABCDE. On the basis of the graph answer the questions.*



1. If company A desires to meet the demand by purchasing surplus production of company, then the most suitable company is
[SSC—CHSL (10+2) Exam, 2015]
(*a*) C (*b*) D
(*c*) E (*d*) B

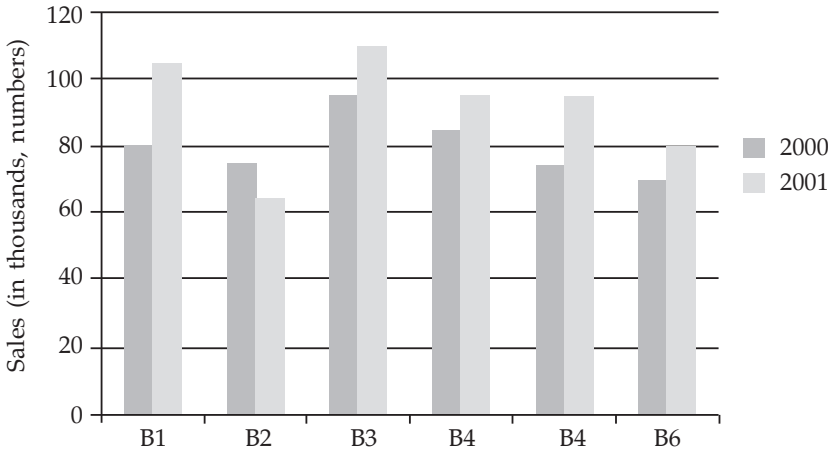
2. If x% of demand for company C equals demand for company B, then x equals.
[SSC—CHSL (10+2) Exam, 2015]
(*a*) 24 (*b*) 20
(*c*) 60 (*d*) 4

3. If the production of company D is *h* times of the production of company A. Then *h* equals:
[SSC—CHSL (10+2) Exam, 2015]
(*a*) 1.5 (*b*) 2.5
(*c*) 1.2 (*d*) 1.8

4. The difference between average demand and average production of the five companies taken together is
[SSC—CHSL (10+2) Exam, 2015]
(*a*) 400 (*b*) 280
(*c*) 130 (*d*) 620

5. The ratio of the number of companies having more demand to those having more production than production than demand is
[SSC—CHSL (10+2) Exam, 2015]
(*a*) 4 : 1 (*b*) 2 : 2
(*c*) 3 : 2 (*d*) 2 : 3

Directions (*Questions* 6–10): *The bar graph given below shows the sales of books (in thousand number from six branches of a publishing company during two consecutive years 2000 and 2001. Sales of books (in thousands numbers) from six branches B1, B2, B3, B4, B5 and B6 of a publishing company in 2000 and 2001.*



6. What is the ratio of the total sales of branch B2 for both years to the total sales of branch B4 for both years? **[RBI Gr. 'B' (Phase—I) Exam, 2015]**

(*a*) 4 : 5 (*b*) 10 : 1

(*c*) 7 : 9 (*d*) 8 : 5

7. Total sales of branch B6 for both the years is what percent of the total sales of branch B3 for both the years? **[RBI Gr. 'B' (Phase—I) Exam, 2015]**

(*a*) 73.17 (*b*) 80.23

(*c*) 75.3 (*d*) 85.7

8. What percent of the average sales of branches B1, B2 and B3 in 2001 is the average sales of branches B1, B3 and B6 in 2000? **[RBI Gr. 'B' (Phase—I) Exam, 2015]**

(*a*) 45% (*b*) 82.5

(*c*) 90.6 (*d*) 87.5

9. What is the average sales of all the branches (in thousands numbers) for the years 2000? **[RBI Gr. 'B' (Phase—I) Exam, 2015]**

(*a*) 73 (*b*) 80

(*c*) 83 (*d*) 85

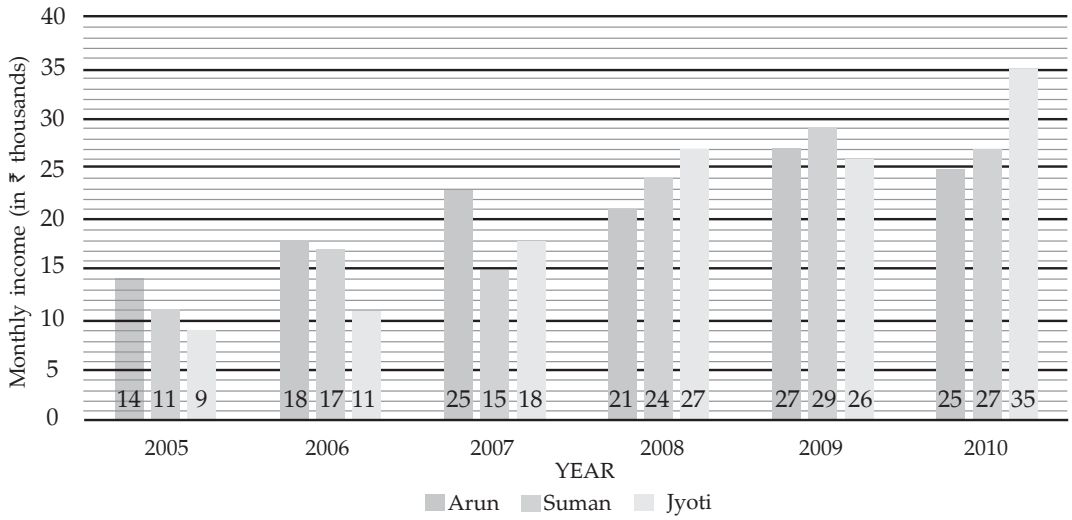
10. Total sales branches B1, B3 and B5 together for both the years (in thousands numbers) is? **[RBI Gr. 'B' (Phase—I) Exam, 2015]**

(*a*) 250 (*b*) 315

(*c*) 560 (*d*) 435

Directions (*Questions* 11–15): ***Study the following graph carefully to answer the questions that follow:***

Monthly income (₹ in thousands) of three different persons in six different years



11. What was the difference between the total monthly salary of Arun in all the years together and Suman's monthly income in the year 2007? **[IBPS—Bank Clerical Exam, 2012]**

(*a*) ₹ 1.24 lakhs (*b*) ₹ 1.14 lakhs

(*c*) ₹ 11.4 lakhs (*d*) ₹ 12.4 lakhs

12. What is the respective ratio between Arun's monthly income in the year 2006, Suman's monthly income in the year 2007 and Jyoti's monthly income in the year 2005? **[IBPS—Bank Clerical Exam, 2012]**

(*a*) 6 : 3 : 5 (*b*) 5 : 6 : 4

(*c*) 5 : 4 : 7 (*d*) None of these

13. In which year was the difference between Jyoti's monthly income and Arun's monthly income second highest? **[IBPS—Bank Clerical Exam, 2012]**

(*a*) 2005 (*b*) 2006

(*c*) 2007 (*d*) 2009

14. Monthly income of Suman in the year 2009 was approximately what percentage of the monthly income of Jyoti in the year 2010? **[IBPS—Bank Clerical Exam, 2012]**

(*a*) 72 (*b*) 89

(*c*) 83 (*d*) 67

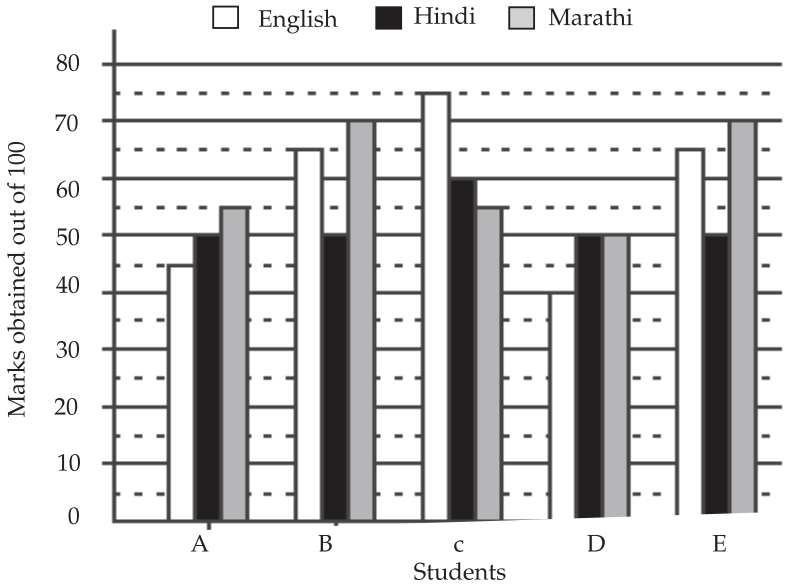
15. What was the percentage increase in the monthly income of Jyoti in the year 2008 as compared to previous year? **[IBPS—Bank Clerical Exam, 2012]**

(*a*) 50 (*b*) 150

(*c*) 160 (*d*) 60

Direction (*Questions* 16–20): ***Study the following graph carefully and answer the questions given below:***

Marks Scored by Five Students in Languages (English, Hindi and Marathi)



16. What is the difference between the total marks obtained by B and the total marks obtained by C?
[Gramin Bank— 2012]
(*a*) 5 marks (*b*) 2 marks
(*c*) 18 mars (*d*) No difference

17. What is C's overall approximate percentage?
[Gramin Bank— 2012]
(*a*) 56 (*b*) 63
(*c*) 70 (*d*) 75

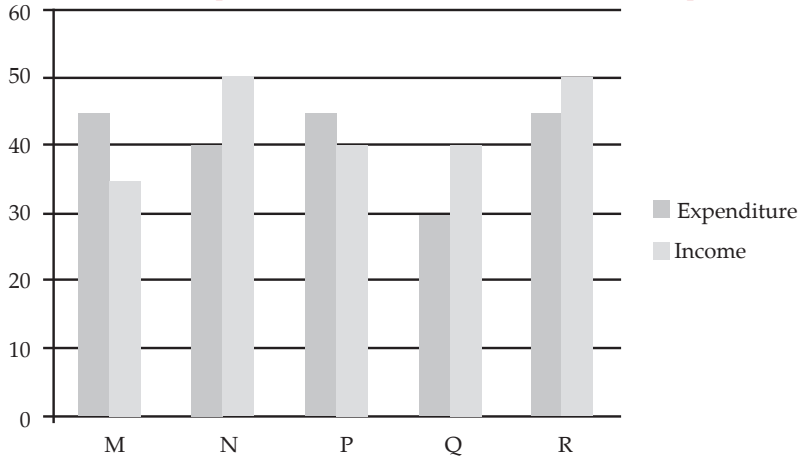
18. Which of the following statements is true?
[Gramin Bank— 2012]
(*a*) 'E' scored the highest total marks
(*b*) 'B' and 'D' had the same score in Hindi
(*c*) A's overall percentage is 50
(*d*) All the students scored maximum marks in Hindi

19. What is the respective ratio of D's marks in English to B's marks in English?
[Gramin Bank— 2012]
(*a*) 8 : 13 (*b*) 5 : 14
(*c*) 7 : 12 (*d*) 6 : 13

20. What are the approximate average marks obtained by D?
[Gramin Bank— 2012]
(*a*) 38 (*b*) 43
(*c*) 50 (*d*) 54

Directions (*Questions* 21–25): ***Study the bar chart given below and answer the following questions:***

Income and Expenditure (in crore ₹) in 2001 of five companies



21. In 2001, the approximate percentage of profit/loss of all the five companies taken together is equal to
[SSC—CHSL (10 + 2) Exam, 2015]
(*a*) 6.88% loss (*b*) 4.65% profit
(*c*) 6.48% profit (*d*) 4% loss

22. If the income of company Q in 2001 was 10% more than that in 2000 and the company had earned a profit of 20% in 2000, then its expenditure in 2000 (in crore ₹) was
[SSC—CHSL (10 + 2) Exam, 2015]
(*a*) 34.34 (*b*) 28.28
(*c*) 29.09 (*d*) 32.32

23. The company earning the maximum percentage of profit in the year 2001 is
[SSC—CHSL (10 + 2) Exam, 2015]
(*a*) Q (*b*) M
(*c*) N (*d*) P

24. The companies M and N together had a percentage of profit/loss of
[SSC—CHSL (10 + 2) Exam, 2015]
(*a*) No loss and no profit (*b*) 12% loss
(*c*) 10% loss (*d*) 10% profit

25. For company R if the expenditure had increased by 20% in the year 2001 from the year 2000 and the company had earned profit of 10% in 2000, the company's income in 2000 was (in crore ₹)
[SSC—CHSL (10 + 2) Exam, 2015]
(*a*) 41.67 (*b*) 35.75
(*c*) 37.25 (*d*) 38.5

ANSWERS

1. (*d*)	**2.** (*a*)	**3.** (*d*)	**4.** (*b*)	**5.** (*c*)	**6.** (*c*)	**7.** (*a*)	**8.** (*d*)	**9.** (*b*)	**10.** (*c*)
11. (*b*)	**12.** (*d*)	**13.** (*b*)	**14.** (*c*)	**15.** (*a*)	**16.** (*a*)	**17.** (*b*)	**18.** (*c*)	**19.** (*a*)	**20.** (*b*)
21. (*c*)	**22.** (*d*)	**23.** (*a*)	**24.** (*a*)	**25.** (*a*)					

SOLUTIONS

1. Difference between demand and production of company A = 3000 – 1500 = 1500
Difference between production and demand of company D = 2700 – 1200 = 1500

2. Given x% of demand for company C = Demand for company B

$$\Rightarrow \frac{2500 \times x}{100} = 600$$

$$\Rightarrow 25x = 600$$

$$\Rightarrow x = \frac{600}{25} = 24$$

3. Production of company D = 2700
Production of company A = 1500

$$h = \frac{\text{Production of company D}}{\text{Product of company A}}$$

$$= \frac{2700}{1500} = \frac{9}{5} = 1.8$$

4. Total production of the five companies
= 1500 + 1800 + 1000 + 2700 + 2200 = 9200
Total demand of the five companies
= 3000 + 600 + 2500 + 1200 + 3300 = 10600
Required difference

$$= \frac{1}{5}(10600 - 9200)$$

$$= \frac{1}{5} \times 1400 = 280$$

5. Number of companies having more demand than production = 3
Number of companies having more production than demand = 2
Required ratio = 3 : 2

6. Required ratio = $\frac{\text{Total Sales of branch B2 for both years}}{\text{Total Sales of branch B4 for both years}}$

$$= \frac{75+65}{85+95} = \frac{140}{180} = \frac{7}{9}$$

7. Total sales of branch B6 for both years = 70 + 80 = 150
Total sales of branch B3 for both years = 95 + 110 = 205
Required percentage $\frac{150}{205} \times 100 = 73.7\%$

8. Total sales (in thousands numbers) of branches B1, B3 and B6 in 200 = 80 + 95 + 70 = 245
Average sales (in thousands number) of branches B1, B3 and B6 in 2000 = $\frac{245}{3}$
Total sales (in thousands number) of branches B1, B2 and B3 in 2001 = 105 + 65 + 110 = 280
Average sales (in thousands number) of branches B1, B2 and B3 in 2001 = $\frac{280}{3}$

So, required percentage = $\frac{\frac{245}{3}}{\frac{280}{3}} \times 100\%$

$$= \frac{245}{280} \times 100 = 87.5\%$$

9. Total sales of all the six branches (in thousand numbers) for the year 2000 = 80 + 75 + 95 + 85 + 75 + 70 = 480

Average sales of all the six branches (in thousand numbers) for the year 2000 = $\frac{480}{8} = 80$

10. Total safes of branches B1, B3 and B5 for both the years (in thousands numbers)
= (80 + 105) + (95 + 110) + (75 + 95) = 560

11. Total monthly salary of Arun in all the years
= 14000 + 18000 + 23000 + 21000 + 27000 + 25000
= ₹ 1,28,000
Monthly salary of Suman in the year 2007 = Rs 15000
Difference between their Salary
= 128000 – 15000 = Rs 1.13 Lakh

12.

In year 2006 Arun's salary	In year 2007 Suman's salary	In year 2005 Jyoti's salary
18000	15000	9000
18	15	9
6	5	3

13.

Year	Arun's Income	Jyoti's Income	Difference
2005	14000	9000	5000
2006	18000	11000	7000
2007	23000	18000	5000
2008	21000	27000	6000
2009	27000	26000	1000
2010	25000	35000	10,000

In 2006 difference between Jyoti's monthly income and Arun's monthly income second highest.

14. Monthly income of Suman in year 2009 = Rs 29000
Monthly income of Jyoti in year 2010 = Rs 35000
= $\frac{29000}{3500} \times 100 = 82.85 \approx 83\%$

15. Joyti's income in 2008 = Rs 27000
Joyti's income in 2007 = Rs 18000
Increase percentage = $\frac{2700-1800}{18000} \times 100$
= $\frac{9000}{18000} \times 100 = 50\%$

16. Total marks obtain by C = 75 + 60 + 55 = 190
Total marks obtain by B = 65 + 50 +70 = 185
Difference = 190 – 185 = 5 marks

17. Total marks of C = 190
Maximum marks = 300
Percentage = $\frac{190}{300} \times 100 = 63.3 \approx 63\%$

18. By observation and solving method A's overall percentage is 50

19. D's marks: B's marks
40 : 65
8 : 13

20. Total marks of D in three subjects = 140
Number of subjects = 3
Average = $\frac{140}{3} = 46.6 \approx 47$

21. Total income of all the five companies
= ₹ (35 + 50 + 40 + 40 + 50) crores = ₹ 215 crores
Total expenditure of all the five companies
= ₹ (45 + 40 + 45 + 30 + 45) crores
= ₹ 205 crores
∴ Profit percent
= $\left(\frac{\text{Income} - \text{Expenditure}}{\text{Expenditure}}\right) \times 100$
= $\frac{215-205}{205} \times 100$
= $\frac{1000}{205} = 4.88\%$

22. Income of company Q in 2000 = $\frac{100}{110} \times 140 = ₹ \frac{400}{11}$ crores
If expenditure in 2000 be ₹ x crores.
Profit % = $\left(\frac{\text{Income} - \text{Expenditure}}{\text{Expenditure}}\right) \times 100$
= $\frac{\frac{400}{11} - x}{x}$
$\Rightarrow \frac{20}{100} = \frac{1}{5} = \frac{400-11x}{11x}$
$\Rightarrow 5 \times 400 - 55x = 11x$
$\Rightarrow 66x = 2000$
$\Rightarrow x = \frac{2000}{66}$
= ₹ 30.30 crores

23. From bar diagram
Profit percent of company Q.
= $\frac{40-30}{30} \times 100$
= $\frac{100}{3} = 33\frac{1}{3}\%$

24. Total income of companies M and N
= ₹ (35 + 50) crores
= ₹ 85 crores
Total expenditure
= ₹ (45 + 40) crores
= ₹ 85 crores
Hence, the companies M and N had no loss and no profit

25. Expenditure of company R in 2000 = $\frac{45 \times 100}{120}$
= ₹ 37.5 crore
Let the income of company in 2000 be ₹ x crores
∴ $10 = \frac{x-37.5}{37.5} \times 100$
$\Rightarrow x = 37.5 = \frac{37. \times 10}{100}$
$\Rightarrow x = 37.5 = 3.75$
$\Rightarrow x - 37.5 = 3.75$
$\Rightarrow$ ₹ 41.25 crores