1. PERCENTAGE SOLUTION

1. (a) 50 (x – y) = 30 (x + y)
= 5x – 5y = 3x + 3y
= 2x = 8y
= x = 4y

2. (c) 50P = 25Q
2P = Q

Then, P = $\frac{x}{100} \times 2P = x = 50$

3. (b) $\frac{20A}{100} = \frac{50B}{100}$

2A = 5B = $A = \frac{5}{2}B$

Required% (अभीष्ट%)

$= \frac{B}{A} \times 100 = \frac{2.B}{5B} \times 100 = 40\%$

4. (a) Let the number (माना कि संख्या) = x
According to the question (प्रश्नानुसार),

$= x \times \frac{18}{100} = \frac{12}{100} \times 75$

= 18x = 12 × 75

= $x = \frac{12 \times 75}{18} = 50$

Hence, required number (अभीष्ट संख्या)

5. (a) $12\frac{1}{2}\% = \frac{1}{8}$

$= \frac{9}{8} \rightarrow$ Income of Ram
$\rightarrow$ Income of Syam

According to the question (प्रश्नानुसार),

	Ram	:	Shaym
Ratio of Income →	9	:	8
	↖ -1 ↗		

Required% (अभीष्ट%) $= \frac{1}{9} \times 100 = 11\frac{1}{9}\%$

6. (c) 80% of A = 50% of B

= $\frac{80}{100}A = \frac{50}{100}B$

= 8 A = 5 B

= $A = \frac{5}{8}B$

Put value of A in given equation,दिए गए समीकरण में A का मान रखने पर,
B = x% of A

= B = $x = \frac{100 \times 8}{5}$

= x = 160

7. (d) According to the question (प्रश्नानुसार),

= $x = \frac{80}{100}y$

= $x = \frac{4}{5}y$

Required (अभीष्ट)% = $\frac{y}{\frac{4}{5}y} \times 100 = \frac{5 \times 100}{4}$

= 125%

8. (a) According to the question (प्रश्नानुसार),

$= \frac{8}{100}x = \frac{4}{100}y$

= 2x = y

= $x = \frac{y}{2}$

= 20% of x = $\frac{20}{100} \times \frac{y}{2} = \frac{y}{10}$

Required (अभीष्ट)% = $\frac{y}{10} \times 100$

9. (d) Let the number (माना कि संख्या) = x
According to the question (प्रश्नानुसार),

$x \times \frac{20}{100} = 120 = x = 600$

Required answer (अभीष्ट उत्तर) = $600 \times \frac{120}{100} = 720$

Alternate (वैकल्पिक विधि):

20% represents – 120, $1\% \rightarrow \frac{120}{20}$

so, 120% = $\frac{120}{20} \times 120 = 720$

10. (a) According to the question

Required % (अभीष्ट %) = $\frac{25}{75} \times 100 = 33\frac{1}{3}\%$

(प्रश्नानुसार),

	x		x
	75		100
	↖ +25 ↗		

Required % (अभीष्ट %) = $\frac{25}{75} \times 100$

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$= 33\frac{1}{3}\%$

11. (c) According to the question (प्रश्नानुसार),

$P \times \frac{P}{100} = 36 \;\; P^2 = 3600 = \;\; P = 60$

12. (c) Required % $= \frac{2}{50} \times 100 = 4\%$

13. (d) Required % $= \frac{\frac{2}{3}}{\frac{1}{3}} \times 100 = 200\%$

14. (a) According to the question

(प्रश्नानुसार), $\frac{10}{100} \times m = \frac{20}{100} \times n$

$$\frac{m}{n} = \frac{20}{10} = \frac{2}{1}$$

$m : n = 2 : 1$

15. (a) Required % (अभीष्ट %) $= \frac{5}{4} \times 100 = 125\%$

Always write a : b in% $= \frac{a}{b} \times 100$

16. (a) Required answer (अभीष्ट उत्तर)

$= \text{Rs.}10000 \times \frac{1}{3} \times \frac{15}{100 \times 100} = \text{Rs.}5$

17. (b) $\frac{30}{100} \times x = 72$

$= x = \frac{72 \times 100}{30} = 240$

18. (d) $\frac{15}{100}(A + B) = \frac{25}{100}(A - B)$

$= 15A + 15B = 25A - 25B$
$= 10A = 40B$
$= A = 4B$

Required% अभीष्ट % $= \frac{A}{B} \times 100$

$= \frac{4B}{B} \times 100 = 400\%$

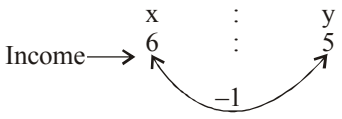
19. (d) Required answer (अभीष्ट उत्तर)

$= 300 \times \frac{1}{4} \times \frac{1}{5} = 15$

20. (b) $\frac{25}{2} \times \frac{x}{100} = 150$

$= x = \frac{150 - 200}{25} = 1200$

21. (b) 20% $= \frac{1}{5}$



Required % (अभीष्ट) $= \frac{1}{6} \times 100 = 16\frac{2}{3}\%$

22. (b) 1 hour 45 min $= 1 + \frac{45}{60} = \frac{7}{4}$ hr.

Required % $= \frac{7}{4 \times 24} \times 100 = 7.291\%$

23. (b) Required answer

$= 100 \times \frac{90}{100} \times \frac{(100 - 40)}{100}$

$= 90 \times \frac{60}{100} = 54$

24. (d) According to the question, (प्रश्नानुसार)

$\frac{30}{100}A = 0.25B = \frac{1}{5}C$

$\frac{3}{10}A = \frac{1}{4}B = \frac{1}{5}C$

$\frac{\frac{A}{10}}{3} = \frac{B}{4} = \frac{C}{5}$

Required ratio of A : B : C $= \frac{10}{3} : 4 : 5$

A : B : C = 10 : 12 : 15

25. (a) Required percentage

$= \frac{0.01}{0.1} \times 100 = 10\%$

26. (a) Let the numbers are a and b where a > b.
माना कि संख्याए a तथा b है जहाँ a > b है।
According to the question,

$(a - b) = \frac{15}{100} (a + b)$

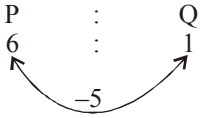
$(a - b) = \frac{3}{20} (a + b)$

$20a - 20b = 3a + 3b$
$17a = 23b$

$\frac{a}{b} = \frac{23}{17}$

Required ratio = 23 : 17

27. (a) According to the question,



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Required % = $\frac{5}{6}\times100=\frac{250}{3}=83\frac{1}{3}\%$

28. (a) Required percentage = $\frac{65}{2000}\times100=\frac{13}{4}\%$

29. (c) $\frac{1\%}{2}=\frac{1}{100\times2}=0.005$

30. (b) Required % = $\frac{\left(2+\frac{45}{60}\right)}{24}\times100$

$=\frac{165\times100}{24\times60}$

= 11.45%

31. (c) Required percentage = $\frac{1.14}{1.9}\times100=\frac{1140}{19}=60\%$

32. (d) Required percentage = 0.001 × 100 = 0.1%

33. (d) 60% of A = $\frac{3}{4}$B

$\frac{3}{5}A=\frac{3}{4}B$

$\frac{A}{B}=\frac{5}{4}=A:B=5:4$

34. (b) $\frac{30}{100}(B-A)=\frac{18}{100}(B+A)$

30B – 30A = 18B + 18A
12B = 48A
B = 4A

$\frac{A}{B}=\frac{1}{4}$

= A : B = 1 : 4
Hence required ratio = 1 : 4

35. (d) Required percentage = $\frac{32}{80}\times100=40\%$

36. (b) $\frac{90}{100}A=\frac{30}{100}B$

= 3A = B .....(i)
B = x% of A

B = $\frac{x}{100}$A

= 3A = $\frac{Ax}{100}$ = x = 300

37. (d) 90% of A = 30% of B
90A = 30B
= B = 3A .....(i)

B = $\frac{2x}{100}$ × A

3A = $\frac{2x}{100}$ × A

= x = 150

38. (d) Required percentage

= $\frac{(1206)}{3\times134}\times100$

= $\frac{402}{134}\times100=300\%$

39. (a) $\frac{120}{100}a=\frac{80}{100}b$

= 3a = 2b

$a=\frac{2}{3}b$ put value of a in given equation (दिए गए समीकरण में a का मान रखने पर),

$=\frac{b+a}{b-a}=\frac{b+\frac{3}{2}b}{b-\frac{2}{3}b}=\frac{\frac{5b}{3}}{\frac{b}{3}}=5$

$=\frac{b+a}{b-a}=5$

40. (a) $\frac{20}{100}(A+B)=\frac{50}{100}(B)$

2A + 2B = 5B
2A = 3B

$A=\frac{3}{2}B$ Put value of A in given equation

(दिए गए समीकरण में a का मान रखने पर),

$\frac{2A-B}{2A+B}=\frac{3B-B}{3B+B}=\frac{2B}{4B}=\frac{1}{2}$

41. (a) $\frac{2}{5}(A+B)=\frac{3}{5}(A-B)$

2A + 2B = 3A – 3B
A = 5B
Put value of a in given equation (दिए गए समीकरण में a का मान रखने पर),

$\frac{2A-3B}{A+B}=\frac{7B}{6B}=\frac{7}{6}$

42. (d) Required percentage

= $\frac{72}{3.6\times1000}\times100=2\%$

43. (a) $x\times\frac{125}{100}=100=x=80$

44. (b) $\frac{50}{100}(P-Q)=\frac{30}{100}(P+Q)$

5 P – 5 Q = 3 P + 3 Q

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2 P = 8 Q
P = 4 Q
Put value of P in given equation (दिए गए समीकरण में P का मान रखने पर)

$$Q = P \times \frac{x}{100}$$

$$Q = 4Q \times \frac{x}{100} = x = 25$$

Hence required value of x = 25

45. (a) $120 \times \frac{25}{100} + 380 \times \frac{40}{100} = x \times 637$

$= 30 + 152 = x \times 637$

$= \frac{182}{637} = x \;=\; x = \frac{2}{7}$

= required answer = $\frac{2}{7}$

46. (c) Required answer

$$\frac{27}{100} \times \frac{36}{100} \times \frac{5}{9} \times 4500$$

47. (a) $1000 \times \frac{25}{100} \times \frac{1}{100} \times \frac{1}{100}$

Required answer = 0.025

48. (a) According to the question, (प्रश्नानुसार)

$$\frac{8x}{100} = \frac{4y}{100}$$

$8x = 4y$ .....(i)

$2x = y$ .....(ii)

20% of $x = \frac{20}{100} \times x$

From equation (समीकरण (i) से)

Required answer = $\frac{20}{100} \times \frac{y}{2} = 10\%$ of y

49. (d) According to the question

A : B : C

1 : 2 : 5 (60A = 30B)

$\left(\frac{A}{B} = \frac{1}{2}\right)$

C = 5

A = 1

Required answer = $\frac{5}{1}$ × 100 = 500%

50. (d) According to the question,

$$\frac{20A}{100} = \frac{30B}{100} = \frac{C}{6}$$

$$\begin{array}{r} A : B = 3 : 2 \\ B : C = 5 : 9 \\ \hline A : B : C = 15 : 10 : 18 \end{array}$$

51. (d) 50% of x = 30% of y

$$\frac{x}{y} = \frac{30\%}{50\%}$$

x : y = 3 : 5

52. (c) $80\% = \frac{4}{5}$

Note: In such type of questions to make your calculation easier assume number which is multiple of 5.
इस तरह के प्रश्नों में अपनी गणना को आसान बनाने के लिए वही संख्या माने जो 5 का गुणज हो।

Let the number (माना कि संख्या)= 5x

According to the question (प्रश्नानुसार),

$$\left[5x \times \frac{80}{100} = 4x\right]$$

4x + 80 = 5x, x = 80

Required number (अभीष्ट संख्या)

= 5x = 80 × 5 = 400

53. (b) $66\frac{2}{3}\% = \frac{2}{3}$

Let the income of the person = 3 units
माना कि व्यक्ति की आय = 3 यूनिट

Expenditure (खर्च) = 2 units (यूनिट)

Savings (बचत) = (3 – 2) = 1 unit (यूनिट)

According to the question (प्रश्नानुसार),

1 unit (यूनिट) = Rs. 1200

2 units (यूनिट) = 2 × 1200 = Rs. 2400

54. (b) $20\% = \frac{1}{5}$, $25\% = \frac{1}{4}$

Case (i) B : C

Ratio of Salaries (वेतनों का अनुपात)

5 : 6

Case (ii) A : B

Ratio of Salaries (वेतनों का अनुपात)

4 : 5

From, Case (i) & (ii)

	A	:	B	:	C
Ratio of salaries	4		5		6

+2

Required answer (अभीष्ट उत्तर)

$$= \frac{2}{4} \times 100 = 50\%$$

55. (a) $40\% = \frac{2}{5}$, $20\% = \frac{1}{5}$

Case (i) A : B

7 : 5

Case (ii) B : C

4 : 5

A : B = 7 : 5

B : C =

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Hence Required ratio (अभीष्ट अनुपात) A : C = 28 : 25

56. (b) Girls's % (लड़कियों की %) = 70%
Boys's (लड़को का %) = (100 – 70)% = 30%
According to the question (प्रश्नानुसार),
30% of students (छात्रों का 30%) = 510
Total number of students in school

(विद्यालय में छात्रों की संख्या) = $\frac{510}{30}\times 100 = 1700$

57. (b) Required number of Boys (लड़कों की अभीष्ट संख्या)

$= \frac{972}{(100-60)}\times 60 = \frac{972}{40}\times 60 = 1458$

Required number of boys (लड़कों की अभीष्ट संख्या)=1458

Alternate: (वैकल्पिक विधि):

Ratio of No. Boys and Girls

Boys		Girls (100% – 60%)
60%		40%
3	:	2

Girls = 2 unit —— 972

1 unit —— $\frac{972}{2} = 486$

Boys = 3 unit —— 3 × 486 = 1458

58. **(d) Note:** In percentage always as-sume data. Which make your Calculation easier.
नोट:- प्रतिशतता में हमेशा उन्हीं तथ्यों को मानें जो आपकी गणना को आसान बनाते हों।

$60\% = \frac{3}{5}$

Let the number (माना की संख्या) = 5x
According to the question (प्रश्नानुसार),

$= 5x\times\frac{3}{5} - 60 = 60$

$= x = \frac{120}{3} = 40$

Hence, Required number = 5x = 5 × 40 = 200

59. (c) 75% = $\frac{3}{5}$

Let the number (माना कि संख्या) = 4x
According to the question (प्रश्नानुसार),

$= 4x\times\frac{3}{4} + 75 = 4x$

= 3x + 75 = 4x , x = 75
Required number (अभीष्ट संख्या)
= 4x = 4 × 75 = 300

60. (a) Let the larger number (माना कि बड़ी संख्या) = 5x
Smaller number (छोटी संख्या) = 20 [Given [दिया है)]
According to the question (प्रश्नानुसार),

= 5x – 20 = $\frac{20}{100_0}\times 5x$

= 5x – 20 = x
= 4x = 20
= x = 5
Hence, Larger number (बड़ी संख्या) = 5 × 5 = 25

61. (c) Required answer अभीष्ट उत्तर

$= \frac{40}{(100-40)}\times 100 = \frac{40}{60}\times 100$

Note: For detailed solution follow the earlier given important note.
नोट: विस्तार में हल के लिए पहले दिए गए महत्वपूर्ण नोट को देंखे।

Alternate (वैकल्पिक विधि):

$40\% = \frac{2}{5}$

A : B
3 5
+2

Required % (अभीष्ट %)= $\frac{2}{3}\times 100 = 66.66\%$

62. (d) Let the IIIrd number is 100 माना कि तीसरी संख्या 100 है
According to the equation (प्रश्नानुसार),

1st		IInd		IIIrd
20	:	50	:	100

Required % (अभीष्ट %) = $\frac{20}{50}\times 100 = 40\%$

63. (d) Let the third number is 100
माना कि तीसरी संख्या 100 है
According to the question (प्रश्नानुसार),

Ist	IInd	IIIrd
75	80	100

Required% (अभीष्ट%) = $\frac{75}{80}\times 100 = 93\frac{3}{4}\%$

64. (d) According to the question (प्रश्नानुसार),

$y = 125 + \frac{125\times 10}{100} = 137.5$

$x = 137.5 - \frac{137.5\times 10}{100}$

x = 137.5 – 13.75
x = 123.75

65. (a) Percentage of girls in school = (100 – 70) = 30%
According to the question (प्रश्नानुसार),
30% of students = 504

Required number of boys = $\frac{504}{30}\times 70$

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= 168 × 7 = 1176

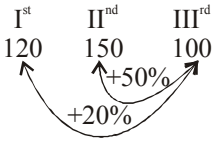
Alternate:

Boy	:	Girls
70	:	30
7	:	3
↓×168		↓×168
1176		504

Hence required number of boys = 1176

66. (c) Let the third number = 100

According to the question (प्रश्नानुसार),



Required answer = $\frac{120}{150}\times 100 = 80\%$

67. (d) Let the third number = 100

According to the question (प्रश्नानुसार),

Required percentage (अभीष्ट%)

$$= \frac{112.5}{125}\times 100 = 90\%$$

68. (c) According to the question (प्रश्नानुसार),

$$60\times\frac{A}{100} = 75\times\frac{B}{100} = 4A = 5B$$

$$B = \frac{4}{5}A$$

$$A \times \frac{x}{100} = \frac{4}{5}A = x = 80$$

69. (a) Let the numbers are 2x and 3x respectively

माना वे दोनों संख्याएँ 2x व 3x है।

According to the question (प्रश्नानुसार),

$$\left(2x\times\frac{20}{100}+20\right) = \left(3x\times\frac{10}{100}+25\right)$$

$$\frac{2}{5}x + 20 = \frac{3}{10}x + 25$$

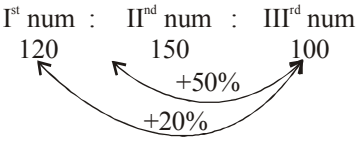
$$\frac{3}{10}x - \frac{2}{5}x = -5$$

3x – 4x = – 50 = x = 50

Hence, required smaller number

= 2x = 2 × 50 = 100

70. (c) Let the third number = 100 units



Required Ratio = 120 : 150 = 4 : 5

71. (b) Let the number be x

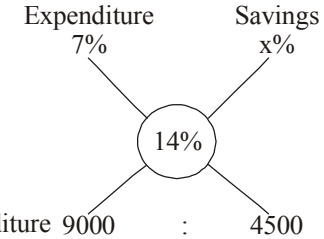
= Required answer = 374.4

72. (c) Income of the person = Rs. 13,500

Expenditure of the person = Rs. 9, 000

Savings of the person = Rs. (13,500 – 9000)

= Rs. 4500



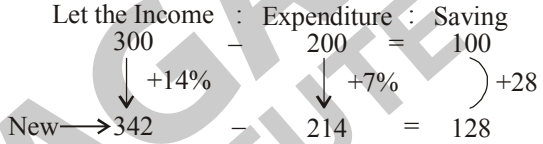
Ratio of Expenditure and savings——	9000	:	4500
	2	:	1

Hence, required increase in savings = 28%

Alternate:

First of all find the ratio of income, expenditure and Savings

Income	:	Expenditure	:	Saving
13,500	:	9000	:	4500
3	:	2	:	1



% change in savings = $\frac{28}{100}\times 100 = 28\%$

73. (c) Let the large number is a and the smaller number is b.

माना कि बड़ी संख्या a है तथा छोटी संख्या b है।

According to the question,

$$(a - b) = \frac{45}{100}(a + b)$$

20a – 20b = 9a + 9b

11a = 29b

$$\frac{a}{b} = \frac{29}{11}$$

Required ratio of a : b = 29 : 11

74. (a) Let the number = x

According to the question,

$$\frac{x\times(100-25)}{100} = 225$$

$$x = \frac{225\times 100}{75} = 300$$

Required percentage = $\frac{(375-300)}{300}\times 100 = 25\%$

75. (c) Let the greater and smaller number is a and b respectively [माना कि बड़ी संख्या तथा छोटी संख्या क्रमशः A तथा B है)

According to the question (प्रश्नानुसार),

Case (i) $a\times\frac{40}{100} = b\times\frac{60}{100}$

2a = 3b

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$$a = \frac{3}{2}b$$

Case (ii) a + b = 150 .....(ii)

From equation (i) and (ii)

$$\frac{3}{2}b + b = 150$$

5b = 300 = b = 60

Value of b = 60 put in equation (i)

$a = \frac{3}{2} \times 60 = 90$

Hence greater number = 90

76. (d) Height ⟶ A 11, B 10 (−1) $\left[10\% = \frac{1}{10}\right]$

Required percentage = $\frac{1}{11} \times 100 = 9\frac{1}{11}\%$

Alternate:

By using formula.

Required percentage = $\frac{1}{11} \times 100 = 9\frac{1}{11}\%$

Alternate:

By using formula.

Required percentage = $\frac{10}{(100+10)} \times 100$

$= \frac{1000}{110} = \frac{100}{11} = 9\frac{1}{11}\%$

77. (c) According to the question (प्रश्नानुसार),

10A = 15B = 20 C

A : B : C = 300 : 200 : 150

A : B : C = 6 : 4 : 3

(6 + 4 + 3) units = Rs. 7800

13 units = Rs. 7800

1 unit = Rs. 600

4 unit = Rs. 600 × 4 = Rs. 2400

78. (a) Let the number be x.

According to the question (प्रश्नानुसार),

$x \times \frac{60}{100} \times \frac{3}{5} = 36$

$x \times \frac{60}{100} \times \frac{3}{5} = 36$

$= x = \frac{36 \times 25}{9} = x = 100$

79. (b) Required percentage

$= \frac{50}{(100+50)} \times 100$

$= \frac{50}{150} \times 100 = 33\frac{1}{3}\%$

A : B

3 : 2

(−1)

Alternate:- $50\% = \frac{1}{2}$

Required percentage = $\frac{1}{3} \times 100 = 33\frac{1}{3}\%$

80. (b) Required percentage

$= \frac{25}{(100+25)} \times 100$

$= \frac{25}{(100+25)} \times 100 = 20\%$

Alternate:- $25\% = \frac{1}{4}$

Nita : Papiya

5 : 4

(−1)

Required percentage = $\frac{1}{5} \times 100 = 20\%$

81. (d) **50% =** $\frac{1}{2}$

Let Z has 2 units of money

माना कि Z के पास 2 यूनिट रूपये है

According to the question,

X : Y : Z

6 : 3 : 2

$\frac{(6+3+2)}{3}$ Units = Rs. 330

= 11 units = Rs. 330

1 unit = Rs. 30

6 units = 30 × 6 = Rs. 180

Hence, X had Rs. 180.

82. (c)

Required percentage = $\frac{25}{(100+25)} \times 100$

Alternate: 25% = $\frac{1}{4}$

X : Y

5 : 4

(−1)

Required percentage = $\frac{1}{5} \times 100 = 20\%$

83. (a) Salary of Tulsiram = Rs. $\frac{720}{4} \times 100$ = Rs. 18,000

Salary of kashyap = $18000 \times \frac{100}{120}$ = Rs. 15000

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84. (a) Let the third number = 100

Ist	IInd	IIIrd
70	63	100
	–7	

Required percentage = $\frac{7}{10}\times100 = 10\%$

85. (d) Required percentage

$= \frac{25}{(100+25)}\times100$

$= \frac{25}{125}\times100 = 20\%$

Alternate: $25\% = \frac{1}{4}$

Required percentage = $\frac{1}{5}\times100 = 20\%$

86. (c) Required percentage

$= = \frac{25}{(100-25)}\times100 = \frac{1}{3}\times100 = 33\frac{1}{3}\%$

Alternate: $25\% = \frac{1}{4}$

A	:	B
3		4
	+1	

Required % = $\frac{1}{3}\times 100 = 33\frac{1}{3}\%$

87. (b) $40\% = \frac{2}{5}$, $25\% = \frac{1}{4}$

A	:	B	=	2 : 5
A	:	C	=	5 : 4
A : B : C	=	10 : 25 : 20		
		+10		

Required % = $\frac{10}{10}\times100$ = **100%**

88. (b) Required percentage

$= \frac{50}{(100-50)}\times100$

$= 100$

Alternate : $50\% = \frac{1}{2}$

A	:	B
1	:	2
	+1	

Required % = $\frac{1}{1}\times100$ = **100%**

89. (a) Required percentage

$= \frac{25}{(100+25)}\times100$

$= 20\%$

Alternate:- $25\% = \frac{1}{4}$

A	:	B
5	:	4
	-1	

Required percentage = $\frac{1}{5}\times100$

= **20%**

90. (a) $60\% = \frac{3}{5}$, $20\% = \frac{1}{5}$

A	:	B	=	8 : 5
B	:	C	=	4 : 5
A : B	:	C	=	32 : 20 : 25

A : C = 32 : 25

91. (a) Percentage of failed students
= (100 – 93)% = 7%
According to the question,
7% → 259
1% → 37
100% → 3700
Total students = 3700

92.(b) Required percentage = $\frac{22}{24}\times$ 100

$= \frac{275}{3} = 91\frac{2}{3}\%$

93. (d) According to the question,

$\frac{30A}{100}+\frac{40}{100}B=\frac{80}{100}B$

$30A = 40B \Rightarrow 3A = 4B \Rightarrow A = \frac{4}{3}B$

Required % = $\frac{B}{A}\times100 = \frac{B\times3}{4B}\times100$

= **75%**

94. (d)
Let the third number = 100

Ist	:	IInd	:	IIIrd
80		60		100
		–20		

Required percentage = $\frac{20}{80}\times100$

= 25%

95. (a) Let the number = x

$\Rightarrow \frac{1}{3}\times x = 96$

$\Rightarrow x = 288$

$\Rightarrow$ Required answer = $\frac{67}{100}\times288$

= 192.96

96. (b) According to the question,

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$x \times \frac{a}{100} = y \times \frac{b}{100}$

$xa = yb \Rightarrow b = \frac{xa}{y}$

Put value of b in given equation (दिए गए समीकरण में b का मान रखने पर),

$z\%$ of b = $z\%$ of $\frac{xa}{y} = \frac{zx}{y}$ % of a

97. (a) 1 hour = 60 min.

1 min + 12 sec = $1 + \frac{12}{60} = \frac{6}{5}$ min

According to the quesion,

$60 \times \frac{y}{100} = \frac{6}{5} \Rightarrow y = 2$

98. (c) Matches won by team (टीम के द्वारा जीता गया मैच) = 24

Required percentage = $\frac{24}{40} \times 100$

= 60%

99. (c) Let the first and second part of a number is a and b respectively.
माना कि एक संख्या के पहले तथा दूसरे भाग क्रमशः a तथा b है।

According to the quesion,

Case : (i) $\frac{80}{100}a - \frac{60}{100}b = 3$

$8a - 6b = 30$ ..... (i)

Case : (ii) $\frac{80}{100}b - \frac{90}{100}a = 6$

$8b - 9a = 60$ ..... (ii)

From equation (i) & (ii)

a = 60, b = 75

Hence required number =

(a + b) = (60 + 75)

= 135

100. (c) Let the numbers = x

According to the questions,

$x - 15 = \frac{18x}{100}$

$x - 15 = \frac{4x}{5}$

$5x - 75 = 4x$

$x = 75$

Required answer = $75 \times \frac{40}{100} = 30$

101. (c) Let the number = x

According to the question,

$x - \frac{17x}{100} = 498$

$100x - 17x = 49800$

$83x = 49800$

$x = \frac{49800}{83} = 600$

102. (d) Let C = 100 units

According to the question,

A	:	B	:	C
150	:	125	:	100

Ratio of numbers → 6 : 5 (+1)

Required percentage = $\frac{1}{5} \times 100 = 20\%$

103. (d) Let x to be added,

According to the question,

$160 \times \frac{15}{100} + x = 240 \times \frac{25}{100}$

$x = 36$

Hence required number = 36

104. (b) Let the number = x

$x \times \frac{90}{100} = 30$

$\Rightarrow x = \frac{100}{3} = 33\frac{1}{3}$

Hence required number = $33\frac{1}{3}$

105. (a) According to the question,

$\frac{15}{100}x = \frac{20}{100}y$

$\Rightarrow 15x = 20y$

$\frac{x}{y} = \frac{20}{15} = \frac{4}{3}$

$x : y = 4 : 3$

106. (b) Marks obtained by D = 320

Marks obtained by C = $320 \times \frac{125}{100}$

= 400

Marks obtained by B = $400 \times \frac{(100-10)}{100} = 360$

Marks obtained by A = $360 \times \frac{125}{100}$

= **450**

Hence, required marks obtained by A (A का अभीष्ट प्राप्तांक) = **450**

107. (c) $22\frac{1}{2}\% = \frac{45}{200} = \frac{9}{40}$

40 ×2 → 80 ; 49 ×2 → 98

Hence required number = 80

108. (a) 75% = $\frac{3}{4}$

Let the number (माना संख्या) = $4x$

According to the question, (प्रश्नानुसार)

$4x \times \frac{3}{4} + 75 = 4x$

$x = 75$

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Number = 75 × 4 = 300

Required answer = $300 \times \frac{40}{100} = 120$

Alternate: 75% = $\frac{3}{4}$

3 + 1 ⟶ 4
75 % 100%
1 unit ⟶ 75
4 unit ⟶ 300

40% of no. = $\frac{300 \times 40}{100}$ = **120**

109. (a) Let the number = x
According to the question,

$x + 320 \times \frac{10}{100} = 230 \times \frac{30}{100}$

$x + 32 = 69$
$x = 37$
Hence, required number = 37

110. (a) 20% = $\frac{1}{5} = \frac{4}{5}$

	X	:	Y
	4	:	5
Let	X	=	4a
	Y	=	5a

Hence, $\frac{y-x}{y} = \frac{5a - 4a}{5a} = \frac{a}{5a} = \frac{1}{5}$

$\frac{x}{x-y} = \frac{4a}{4a - 5a} = \frac{4a}{-a} = -4$

Hence required answer = $\left(\frac{1}{5}, -4\right)$

111. (a) Required number of literate people (साक्षर लोगों की अभीष्ट संख्या)

= $6600 \times \frac{30}{100}$
= 1980

112. (d) Required Answer

= $\frac{50}{(100+50)} \times 100 = 33\frac{1}{3}$

Alternate :- 50% = $\frac{1}{2}$

A : B
3 : 2
-1

Required Answer = $\frac{1}{3} \times 100 = 33\frac{1}{3}\%$

113.(a)
According to the question,

$\frac{5}{100}A + \frac{4}{100}B = \frac{2}{3}\left[\frac{6A}{100} + \frac{8B}{100}\right]$

$5A + 4B = \frac{2}{3}(6A + 8B)$

$15A + 12B = 12A + 16B$
$3A = 4B$

$\frac{A}{B} = \frac{4}{3} \Rightarrow$ **A :B = 4 : 3**

114. (b) To get back to the original number it is to be reduced by(आरंभिक संख्या प्राप्त के लिए इसे कम करना होगा),

= $\frac{x}{(100+x)} \times 100\%$

= $\frac{100x}{(100+x)}\%$

115. (d) Let the number is = x
According to the question,

$\frac{1}{5}$ of $\frac{1}{2}$ of $x = 20$

$\frac{1}{5} \times \frac{1}{2}x = 20$
$x = 200$

$\therefore$ 20% of 200 = $\frac{20}{100} \times 200 = 40$

116. (b) According to the question,

$\Rightarrow 90 \times 83\frac{1}{3}\% = x \times 60\%$

$\Rightarrow x =$ **Rs. 125**

117. (b) $x \times \frac{51}{100} = 714$

$x = 1400$

$\therefore$ 25% of $x = 1400 \times \frac{25}{100} = 350$

118. (c)

$20\% \frac{1}{5}$ Increase in price (मूल्य में वृद्धि) / Initial Price (आरंभिक मूल्य)

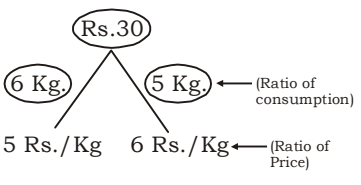
Initial Price (आरंभिक मूल्य)	Final Price (अंतिम मूल्य)
5	6
-1	

Hence, Required reduction = $\left(\frac{1}{6} \times 100\right)$

= $16\frac{2}{3}\%$

अत: अभीष्ट कटौती = $\left(\frac{1}{6} \times 100\right) = 16\frac{2}{3}\%$

यदि चीनी का मूल्य 20% बढ़ गया हो तथा खर्चा अपरिवर्तित रहे तो माना चीनी का आरंभिक मूल्य 5 रू० है तो नया मूल्य 6 रू० हो गया तो हम उस का कुल खर्च मान लेते हैं जो 5 व 6 दोनों से भाग हो जाए अर्थात् 5 व 6 का LCM = 30 रू०



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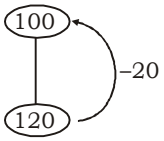
अत: यदि खर्चा समान रखना हो तो जिस अनुपात में मूल्य में परिवर्तन होगा उस के उलटे अनुपात में खपत में परिवर्तन होगा।

अत: इस प्रकार के प्रश्नों को करने का सबसे तरीका य ह है कि आरंभिक मूल्य (Initial Price) में 100 रू ० मान लें तथा मूल खपत (original consumption) 1 किलोग्राम

मान लें तो इस प्रकार मूल खर्च (Original Expenditure) 100 रू ० हो जाएगा तथा इस प्रकार जो परिवर्तन मूल्य में होगा वही परिवर्तन खर्च में ही होगा। क्योंकि खपत को तो हमने 1 किलोग्राम ही माना।

अत: मूल खर्च



$\frac{20}{120} \times 100 = 16\frac{2}{3}\%$

Note: (i) If the price of a commodity decrease by r%, then increase in consumption, so as not to decrease expenditure on this item is

(ii) If first value is r% more than the second value, then the second is

$\left[\frac{r}{100+r} \times 100\right]$% less than the first value.

नोट: **(i)** यदि किसी वस्तु का मूल्य में r% की कमी होती है, तो खर्च में कोई कमी न हो इस के लिए उपभोग $\left[\frac{r}{100+r} \times 100\right]$% को बढ़ाना होगा।

(ii) यदि प्रथम मान, दूसरे मान से r% अधिक हो, तो दूसरा मान, पहले मान से $\left[\frac{r}{100+r} \times 100\right]$% कम होगा।

Alternate (वैकल्पिक विधि):

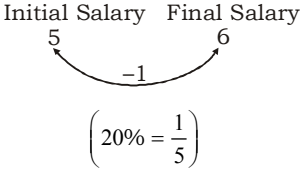
Required answer (अभीष्ट उत्तर)

$= \frac{20}{(100+20)} \times 100 = 16\frac{2}{3}\%$

119. (b) Required answer (अभीष्ट उत्तर)

$= \frac{20}{(100+20)} \times 100 = 16\frac{2}{3}\%$

Alternate (वैकल्पिक विधि)



$\left(20\% = \frac{1}{5}\right)$

Required % (अभीष्ट %) $= \frac{1}{6} \times 10 = 16\frac{2}{3}\%$

120. (a) Required answer (अभीष्ट उत्तर)

$= \frac{10}{(100+10)} \times 100 = \frac{100}{11}\% = 9\frac{1}{11}\%$

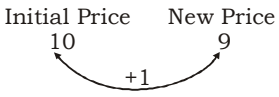
121. (d) Required % (अभीष्ट%)

$= \frac{10}{(100-10)} \times 100$

$= \frac{10}{90} \times 100$

$= 11\frac{1}{9}\%$

Alternate:



Required % $= \frac{1}{9} \times 100 = 11\frac{1}{9}\%$

122. (a) Required % (अभीष्ट%)

$= \frac{25}{(100+25)} \times 100$ = **20%**

123. (a)

Note: If the value of a number is first increased by x% and later decreased by x%, then net change is always a decrease which is equal to $\frac{x^2}{100}$%

नोट: यदि किसी संख्या का मान पहले x% बढ़ा दिया जाता है और बाद में फिर x% घटा दिया जाता है, तो संख्या के मान में हमेशा $\frac{x^2}{100}$% के बराबर कमी होगी।

Hence, Required change in salary

(वेतन में अभीष्ट परिवर्तन) $= \frac{(20)^2}{100}$ = 4% Decrease

124.(c)

Note:- In such type of questions to save your valuable time you can use below given formula.

नोट: इस तरह के प्रश्नों में अपने समय की बचत के लिए आप नीचे दिए इस नियम को अपना सकते हैं।

$$\boxed{\text{Net effect\%} = X + Y + \frac{XY}{100}}$$

Always use +ve sign for increment

– ve sign for decrement

Required answer = $20 - 10 - \frac{20 \times 10}{100}$

= 10 – 2

= 8%

Hence, Net q% Increment = **8%**

125.(c) Net % effect on revenue

$= -10 + 10 - \frac{10 \times 10}{100}$

= – 1%

Hence % reduction in Revenue = 1%

Alternate:

% Reduction = $\frac{x^2}{100} = \frac{(10)^2}{100} = 1\%$

126. (b) 10% = $\frac{1}{10}$

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Initial price	:	Final Price
10	:	11
10	:	11
100		121

-21

% Reduction = $\frac{21}{121}\times 100$

= $\frac{2100}{121}$ = 17.36%

127. (a) 25% = $\frac{1}{4}$, 20% = $\frac{1}{5}$

Initial Price	:	Final Price
4 ×	:	3 ×
5	:	6
20	:	18

–2

% decrement = $\frac{2}{20}\times 100 = 10\%$

Alternate:- By using below given formula,

% Net effect = $x + y + \frac{xy}{100}$

% Change = $-25 + 20 - \frac{25\times 20}{100}$

% Change = – 10%

Note:-Negative sign shows decrement.

नोट: नकारात्मक संकेत अवमूल्यन को दर्शाता है।

Hence Required decrement = 10%

128. (d) % decrease = $\frac{x^2}{100} = \frac{(10)^2}{100}$ = 1%

Alternate:-

Initial	:	Final
10	:	11
10	:	9
100		99

-1

129. (b) 20% = $\frac{1}{5} = \frac{4\rightarrow \text{Final}}{5\rightarrow \text{initial}}$

Initial wages	Final wages
5	4

+1

Required percentage

= $\frac{1}{4}\times 100$ = 25%

Alternate :

Required answer = $\frac{20}{(100-20)}\times 100$

= $\frac{20}{80}\times 100 =$ **25%**

Note:- By using formula, $\left[\frac{r}{(100-r)}\times 100\right]$

130. (b) Required answer = $\frac{10}{(100-10)}\times 100$

= $\frac{100}{9} = 11\frac{1}{9}$**%**

131 (a) 20% = $\frac{1}{5}$

Initial	:	Final
5 ×	:	6 ×
5	:	6
25	:	36

–11

Required percentage of reduction

= $\frac{11}{36}\times 100$

= $\frac{275}{9} = 30\frac{5}{9}\%$

132. (d) 25% = $\frac{1}{4} = \frac{5\rightarrow \text{Final employees}}{4\rightarrow \text{Initial employees}}$

25% = $\frac{1}{4} = \frac{3\rightarrow \text{Final wages}}{4\rightarrow \text{Initial wages}}$

	Initial	:	Final
Employees →	4 ×	:	5 ×
Wages →	4	:	3
	16	:	15

–1

Required reduction = $\frac{1}{16}\times 100 = \frac{25}{4}\%$

133. (d) r% = $\frac{r}{100}$

Initial Price	Final
100	(100 + r)
100	(100 – r)
10000	(100+r)(100 – r)

According to the question,
(100 + r) (100 – r) units = ₹ 1
($10000 - r_2$) units = ₹ 1

1 unit = $\left(\frac{1}{1000-r^2}\right)$

Original Price (वास्तविक मूल्य)= $\left(\frac{1}{10000-r^2}\right)$

134. (d) Required percentage of reduction

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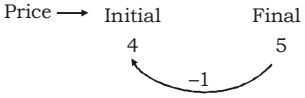
(कटौती का अभीष्ट प्रतिशत)

$= \frac{25}{(100+25)} \times 100 = \frac{25}{125} \times 100$

$= 20\%$

Alternate:- $25\% = \frac{1}{4}$



Required percentage reduction

$= \frac{1}{5} \times 100 = 20\%$

135. (b) Let the original number(माना कि वास्तविक संख्या) = x

According to the question(प्रश्नानुसार),

$x \times \frac{90}{110} \times \frac{110}{100} = (x - 50)$

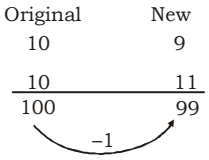
$x \times \frac{99}{100} = x - 50$

$99x = 100x - 5000$

$\boldsymbol{x = 5000}$

Hence original number = **5000**

Alternate:



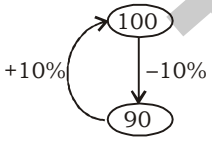
According to the question(प्रश्नानुसार),

1 unit = 50

100 unit = 50 × 100= 5000

Original number = 5000

136.(c) Let the initial expenditure = 100 units



$\frac{10}{90} = \frac{1}{9} = \frac{10}{9} \rightarrow$ New Price

$\rightarrow$ Original Price

Reduced price $= \frac{837}{10 \times 6.2} = \frac{837}{62}$

=₹13.50/kg.

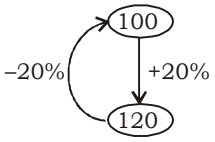
137. (c) $20\% = \frac{1}{5}$

	Initial		Final
Price	5		6
consumption	×6	−1	×5
expenditure	30		30

Required Rate = 1:6

Alternate :

Let Initial expenditure = ₹ 100



Required ratio = 20:120 = 1:6

138. (b) By using formula,

% decrease $= \frac{x^2}{100}$

$x = 20\%$

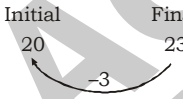
% decrease $= \frac{20 \times 20}{100}$ = **4% decrease**

139.(b) Required reduction in consumption (उपभोग में अभीष्ट कटौती)

$= \frac{15}{(100+15)} \times 100 = \frac{15}{115} \times 100$

$= \frac{300}{23} = 13\frac{1}{23}\%$

Alternate:- $15\% = \frac{3}{20}$



% Reduction $= \frac{3}{23} \times 100$

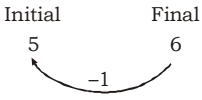
$= \frac{300}{23} = 13\frac{1}{23}\%$

140. (b) Required Reduction in price (मूल्य में अभीष्ट कमी)

$= \frac{20}{(100+20)} \times 100 = \frac{20}{120} \times 100$

$= 16\frac{2}{3}\%$

Alternate: $20\% = \frac{1}{5}$



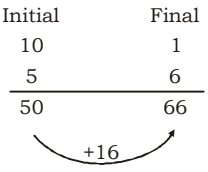
% Reduction $= \frac{1}{6} \times 100 = 16\frac{2}{3}\%$

141. (c)

Required answer = 10 + 20 + $\frac{10 \times 20}{100}$

= 10 + 20 + 2 = **32%**

Alternate: $10\% = \frac{1}{10}$, $20\% \frac{1}{5}$



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Required percentage increase

$= \frac{16}{50} \times 100 =$ **32%**

142. (c) Decrease in area $= \frac{x^2}{100}\% = \frac{(10)^2}{100} =$ **1%**

Alternate:

Initial : Final

10 : 11

10 : 9

100 : 99

-1

% decrease in area $= \frac{1}{100} \times 100 =$ **1%**

143. (b) Required percentage

$= \frac{20}{(100-20)} \times 100 = 25\%$

Alternate: $20\% = \frac{1}{5}$

A : B

5 : 4

+1

Required $\% = \frac{1}{4} \times 100 =$ **25%**

144. (c) $10\% = \frac{1}{10}$

Initial Final

10 9

10 11

100 99

−1

Required % reduction $= \frac{1}{100} \times 100$

$=$ **1%**

Alternate: Net Reduction $= \frac{x^2}{100}$

$= \frac{(10)^2}{100}$

$=$ **1%**

145. (b) % change $= \frac{R}{100 \pm R} \times 100\%$

Required answer $= \frac{50}{(100+50)} = \frac{1}{3}$

146. (d) % change $= \frac{R}{100 \pm R} \times 100\%$

Required answer $= \frac{40}{(100-40)} \times 100$

$= \frac{40}{60} \times 100 = \frac{200}{3} = 66\frac{2}{3}\%$

147.(b) % change $= \frac{R}{100 \pm R} \times 100\%$

Required percentage $= \frac{25}{(100+25)} \times 100$

$= 20\%$

Alternate: $25\% = \frac{1}{4}$

Initial Final

4 5

−1

% reduction $= \frac{1}{5} \times 100 =$ **20%**

148. (b) $25\% = \frac{1}{4}$, $30\% = \frac{3}{10}$

	Initial		Final
Price →	4	×	3
Sale →	10	×	13
	40		39

−1

% decrease $= \frac{1}{40} \times 100$

$= 2\frac{1}{2}\%$ decrease.

149. (b) Let the initial expenditure = 100 units

100

+20% −20%

80

Increase in consumption $= \frac{20}{80} = \frac{1}{4}$

$= \frac{5}{4} \rightarrow$ New

$\rightarrow$ Original

Original Price $= \frac{36 \times 1000}{4 \times 500}$

$\left[\therefore 500\text{gm} = \frac{500}{1000}\text{kg}\right]$

Original Price = ₹ **18/kg.**

150. (c) By using formula

$x = 25\%$ Net decrease $= \frac{x^2}{100}\%$

Net decrease $= \frac{(25)^2}{100} = \frac{625}{100} =$ **6.25%**

Alternate:- $25\% = \frac{1}{4}$

Initial : Final

4 : 3

4 : 5

64 : 15

-1

% decrease $= \frac{1}{16} \times 100 = \frac{100}{16} =$ **6.25%**

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