Rakesh Yadav Sir's

ARITHMETIC

for

SSC

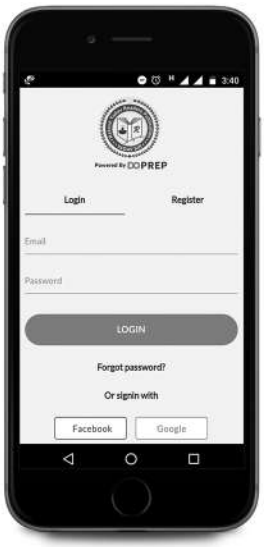
Each Questions with Detailed Solution

Useful *for* SSC

- SSC Graduate Level Tier-I &Tier-II
- SSC CPO
- 10+2 (CHSL)
- CAPFs, Delhi Police
- FCI
- Matric Level
- Multi-Tasking Staff
- Constable GD
- All Banking Exam

by **Rakesh Yadav**
Selected
Excise Inspector

Rakesh Yadav Readers Publication



हमारी एप से सभी प्रश्नो के मुफ़्त ऑनलाइन सल्यूशन्स कैसे पाएँ ?

कैसे इस्तेमाल करें :

- RYP eBook App को Android Play Store या iOS App Store से डाउनलोड करके इनस्टॉल करें |
- अपनी E-mail का इस्तेमाल करके एक अकाउंट बनाएँ |

ध्यान दें : यदि आप पहले से हमारी दूसरी एप RYP Ask Doubt इस्तेमाल कर रहें हैं, तो आपको नया अकाउंट बनाने की आव्यशकता नहीं है | आप RYP Ask Doubt के ही E-mail और Password का इस्तेमाल करके RYP eBook App एप में लॉग इन कर सकते हैं |

ऑनलाइन किताब मे कैसे एनरोल करें

- अपने फोन पर RYP eBook App को खोलें |
- मेन मेनू से "Book" स्क्रीन पे जाएँ |
- QR कोड स्कएनर को स्टार्ट करने के लिए **"+"** आइकन पर क्लिक करें |
- अपने किताब के QR कोड को प्राप्त करने के लिए इस पेज पर लगे हुए कार्ड को स्क्रैच करें |

(कृपया इस QR कोड को किसी को ना दें अन्यथा आप इस किताब के ऑनलाइन वीडियोस को नही देख पाएँगे)

- इस किताब के ऑनलाइन कॉटेंट मे खुद को एन्रॉल करने के लिए एप से इस QR कोड को स्कैन करें |

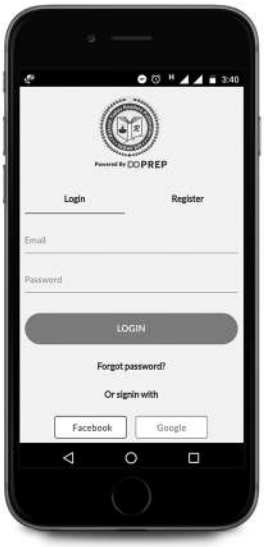
किताब के ऑनलाइन कॉंटेंट को कैसे पढ़ें

- इस किताब के प्रत्येक पेज पे एक QR कोड लगा हुआ है |
- किसी भी पेज के QR कोड को स्कैन करने के लिए RYP eBook App को खोलें और मेन मनु से Scan QR Code स्क्रीन पे जाएँ और QR कोड को स्कैन करें |
- सही प्रकार से स्कैन करने पर एक स्क्रीन खुलेगी जिसपे इस पेज के सारे प्रश्न व ऑनलाइन कॉटेंट होगा |
- किसी भी प्रश्न का हल देखने के लिए उस प्रश्न पर क्लिक करें |

स्क्रैच करें

QR कोड स्कैन करने के टिप्स :

- किताब को समतल सतह पे रखें |
- अपने मोबाइल फोन को QR कोड के उपर इस प्रकार पकड़ें की QR कोड स्कैनर स्क्रीन पर बने हुए चतुर्भुज के भीतर ही रहे और सही प्रकार से दिखता रहे |
- स्कैन करते समय QR कोड पर पर्याप्त रोशनी आने दें | आप एप में QR कोड स्कएनर पर दिए हुए फ्लैश लाइट को भी जला सकते हैं |



Access free online content through our App!

Getting started :

· Download and install our **RYP eBook App** from ***Android Playstore/Apple store.***

· Create an account with **valid E-mail and Phone number**.

Note : *If you are a registered user of our another app, RYP Ask Doubt, you don't need to create new account on RYP eBook App* ***(skip this step)****. You can use* ***login credentials of RYP Ask Doubt app to login on RYP eBook app****.*

Enrolling into a book :

· **After launching app** Navigate to the **Books section** from the left navigation menu.

· Tap on the **Add icon to start QR Code scanner.** (Refer Tips to scan a QR Code section)

· **Scratch the card present on bottom of this page** to reveal a QR Code unique to your book. *(Don't share this QR Code with anyone else other wise you will not be able to use free online content of this book)*

· **Scan QR Code** on the book to get yourself enrolled and access the content of the book ***anytime anywhere***.

Accessing the content of Book online :

· A QR Code is present **on each page** of this Book.

· For any book, you are already enrolled into, you can access the content online, by simply **scanning the QR Code on the page**.

· To scan QR Code of any particular page, launch RYP eBook app & navigate to the **Scan QR Code section** from the left navigation menu.

· On successfully scanning the QR Code **you'll be redirected to the list of question/learning content of that page.**

· Tap on any question to view its **detailed solution.**

Scratch this

Tips to scan a QR Code :

· Keep the paper with QR Code, on a **flat surface.**

· Hold your device over a QR Code so that it fits in the defined square in the scanner and is **clearly visible** within your smartphone's screen.

· Make sure you have proper lighting around. If required, use **flashlight** *(for devices supporting the same)* in the scanner.

मेरे प्यारे दोस्तों, यदि आप राकेश यादव सर की Online Class लेना चाहते हैं तो हमारे Offical YouTube Channel *Rakesh Yadav Readers Publication* (http://www.youtube.com/c/RakeshYadavReadersPublication) को *Subscribe* करें। तथा सभी Chapters की *Video/ Purchase/Rent* करें और अपने आप को Coaching की भीड़ से बचायें।

"'Digital India' के Concept को अपनाये" और घर बैठे भारत के सर्वश्रेष्ठ Teacher *'Rakesh Yadav Sir (Wizard of Maths)'* से पढ़ें, और आसानी से घर बैठे Govt. Job में selection लें।

- हम हर Subject की व हर Exam की Online Class YouTube पर Provide कराते हैं।
- सभी One Day Competitive Exams की Online Coaching के लिए भारत के एक मात्र विश्वसनीय संस्थान Rakesh Yadav Readers Publication से पढ़िये, क्योंकि हम Toppers और Teachers दोनों को पढ़ाते हैं।
- हमारे यहाँ Pendrive Classes भी Available हैं, जिन्हें आप हमसे खरीद सकते हैं।
- हमारे यहाँ Coaching Institutes में Video Classes भी Provide की जाती हैं (Offline व VAST माध्यम से)।
- All our Video Classes are different for : **SSC/CDS/NDA/IBPS/SBI/DMRC/SSC-JE/** and other one day examinations, each.
- हम भारत के विभिन्न Coaching Centers पर Expert Teachers भी Provide कराते हैं। कोई भी Coaching Center हम से Best Teachers के लिए सम्पर्क कर सकता है।
- हमारे यहाँ हर भाषा में Video Classes Available है।

You can purchase All our books at

www.rakeshyadavpublication.com

To purchase all our video classes in pendrive call at

9268468484, 9268668686, 9868946424

To follow

Rakesh Yadav sir :

rakesh.yadav0011@gmail.com,

https://twitter.com/rakeshyadavsir

RYRP DIGITAL EDUCATION

RYPAskDoubtApp	RYPeBookApp	RakeshYadavReadersPublication
◆ Post your problems anytime from anywhere. ◆ Available for both Android's and iOS. ◆ Get solutions by the	◆ Solutions of every book of Rakesh Yadav Readers Publication. ◆ Free concept videos for our book readers. ◆ Online test series for practice. ◆ Available for both Android's & iOS.	◆ Video lectures for study at home ◆ Video's available in HD Quality ◆ Online Videos by the expert

RYPAskDoubtApp RYPeBookApp RakeshYadavReadersPublication

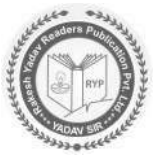
for

&

Rakesh Yadav Readers Publication Pvt. Ltd

All my books are available at: www.rakeshyadavpublication.com

Published by



Rakesh Yadav Readers Publication Pvt. Ltd.

Address : H.no. 1425, Outram lane
near B.B.M. Depot GTB Nagar Delhi-110009

Contact us: 92-686-686-86, 92-684-684-84

Edition-Ist 2016

Edition-IIst 2017

Editorial Team: Rahul, Bhuvnesh, Mohit, Naveen Tiwari, Dheeraj and Bishesh
Editor-in-chief - Karan Chaudhary

• **Disclaimer**

Information contained in this work has been obtained by Rakesh Yadav Readers Publication Pvt. Ltd. from sources believed to be reliable, However neither Rakesh Yadav Readers Publication Pvt. Ltd. or not Its Author guarantee the accuracy or completeness of any information published herein and neither Rakesh Yadav Readers Publication Pvt. Ltd. or Its authors shall be responsible for any error, omissions or damage arising out of use of this information, this is published with understanding that Rakesh Yadav Readers Publication Pvt. Ltd. and Its author are supplying information but are not attempting to render engineering or other professional services, if such services are required, the assistance of an appropriate professional should be sought.

All disputes subject to New Delhi Jurisdiction only

Content

01

Percentage

How to change % into fraction

RY - I

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

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

$40\% = \frac{40}{100} = \frac{2}{5}$

$70\% = \frac{70}{100} = \frac{7}{10}$

$16\frac{2}{3}\% = \frac{50}{3}\% = \frac{1}{6}$

$14\frac{2}{7}\% = \frac{100}{7}\% = \frac{1}{7}$

RY - II

How to change the fraction into %

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

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

$\frac{1}{6} \Rightarrow \frac{1}{6} \times 100 = \frac{50}{3} = 16\frac{2}{3}\%$

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

RY - III

The following fractions are generally used in exams. So, I recommend you to remember these fractions. These fractions are very useful to solve the lengthy questions with in time.

$\frac{1}{2}=50\%$ $\frac{1}{11}=9\frac{1}{11}\%$ $\frac{1}{40}=2\frac{1}{2}\%$

$\frac{1}{3}=33\frac{1}{3}\%$ $\frac{1}{12}=8\frac{1}{3}\%$ $\frac{1}{50}=2\%$

$\frac{1}{4}=25\%$ $\frac{1}{13}=7\frac{9}{13}\%$ $\frac{3}{8}=37\frac{1}{2}\%$

$\frac{1}{5}=20\%$ $\frac{1}{14}=7\frac{1}{7}\%$ $\frac{5}{8}=62\frac{1}{2}\%$

$\frac{1}{6}=16\frac{2}{3}\%$ $\frac{1}{15}=6\frac{2}{3}\%$ $\frac{4}{7}=57\frac{1}{7}\%$

$\frac{1}{7}=14\frac{2}{7}\%$ $\frac{1}{16}=6\frac{1}{4}\%$ $\frac{5}{7}=71\frac{3}{7}\%$

$\frac{1}{8}=12\frac{1}{2}\%$ $\frac{1}{20}=5\%$ $\frac{1}{9}=11\frac{1}{9}\%$

$\frac{1}{24}=4\frac{1}{6}\%$ $\frac{1}{10}=10\%$ $\frac{1}{25}=4\%$

RY - IV

These are Basic Fraction.

(i) If I want to know the % value of $\frac{5}{9}$ then go to $\frac{1}{9}$

$\frac{1}{9} = 11\frac{1}{9}\% = \left(11 + \frac{1}{9}\right)\%$

$\frac{5}{9} = 55\frac{5}{9}\%$

(ii) Find the % value of $\frac{3}{8}$

$\frac{1}{8} = 12\frac{1}{2}\% = \left(12 + \frac{1}{2}\right)\%$

$\frac{3}{8} = 36 + \frac{3}{2} = 36 + 1\frac{1}{2} = 37\frac{1}{2}\%$

(iii) Find the % value of $\frac{5}{6}$

$\frac{1}{6} = 16\frac{2}{3}\% = 16 + \frac{2}{3}$

$\frac{5}{6} = 80 + \frac{10}{3}$

$= 80 + 3\frac{1}{3}\% = 83\frac{1}{3}\%$

(iv) Find the % value of $\frac{2}{3}$

$\frac{1}{3} = 33\frac{1}{3}\% = \left(33 + \frac{1}{3}\right)\%$

$\frac{2}{3} = 66 + \frac{2}{3} = 66\frac{2}{3}\%$

(v) Find the % value of $\frac{5}{8}$

$\frac{1}{8} = 12\frac{1}{2}\% = 12 + \frac{1}{2}$

$\frac{5}{8} = 60 + \frac{5}{2} = 60 + 2\frac{1}{2} = 62\frac{1}{2}\%$

(vi) Find the % value of $\frac{4}{7}$

$\frac{1}{7} = 14\frac{2}{7}\% = 14 + \frac{2}{7}\%$

$\frac{4}{7} = 56 + \frac{8}{7}\% = 56 + 1\frac{1}{7} = 57\frac{1}{7}\%$

(vii) Find the % value of $\frac{7}{12}$

$\frac{1}{12} = 8\frac{1}{3}\% = 8 + \frac{1}{3}\%$

$\frac{7}{12} = 56 + \frac{7}{3} = 56 + 2\frac{1}{3} = 58\frac{1}{3}\%$

(viii) Find the % value of $\frac{11}{15}$

$\frac{1}{15} = 6\frac{2}{3}\% = 6 + \frac{2}{3}\%$

$\frac{11}{15} = 66 + \frac{22}{3}\%$

$= 66 + 7\frac{1}{3}\% = 73\frac{1}{3}\%$

(ix) Find the % value of $\frac{9}{16}$

$\frac{1}{16} = 6\frac{1}{4}\% = 6 + \frac{1}{4}\%$

$\frac{9}{16} = 54 + \frac{9}{4} = 54 + 2\frac{1}{4}\%$

$= 56\frac{1}{4}\%$

(x) Find the % value of $\frac{7}{40}$

$\frac{1}{40} = 2\frac{1}{2}\% = 2 + \frac{1}{2}\%$

$\frac{7}{40} = \left(14 + \frac{7}{2}\right)\% = 17\frac{1}{2}\%$

RY - V

How to change the fraction whose % value is more than 100%

(i) Find the % value of $\frac{7}{5}$

$\frac{7}{5} \Rightarrow \frac{5}{5} + \frac{2}{5}$

$\Rightarrow 100\% + 40\%$

$\Rightarrow 140\%$

(ii) Find the % value of $\frac{35}{8}$

$\frac{35}{8} = \frac{32}{8} + \frac{3}{8}$

$= 400\% + 37\frac{1}{2}\% = 437\frac{1}{2}\%$

(iii) Find the % value of $\frac{33}{7}$

$\frac{33}{7} = \frac{28}{7} + \frac{5}{7}$

$= 400\ \% + 71\frac{3}{7}\% = 471\frac{3}{7}\%$

(iv) Find the % value of $\frac{23}{12}$

$\frac{23}{12} = \frac{12}{12} + \frac{11}{12}$

$= 100\% + 91\frac{2}{3}\% = 191\frac{2}{3}\%$

Alternatively:

$\frac{23}{12} = \frac{24}{12} - \frac{1}{12}$

$= 200\% - 8\frac{1}{3}\% = 191\frac{2}{3}\%$

(v) Find the % value of $\frac{41}{6}$

$\frac{41}{6} = \frac{42}{6} - \frac{1}{6}$

$= 700\% - 16\frac{2}{3}\% = 683\frac{1}{3}\%$

RY - VI

How to change % into fraction whose % value is more than 100%

(i) Find the fraction value of $157\frac{1}{7}\%$

$157\frac{1}{7}\% = 100\% + 57\frac{1}{7}\%$

$= 1 + \frac{4}{7} = \frac{11}{7}$

(ii) Find the fraction value of $616\frac{2}{3}\%$

$616\frac{2}{3}\% = 600\% + 16\frac{2}{3}\%$

$= 6 + \frac{1}{6} = \frac{37}{6}$

(iii) Find the fraction value of $366\frac{2}{3}\%$

$366\frac{2}{3}\% = 300\% + 66\frac{2}{3}\%$

$= 3 + \frac{2}{3} = \frac{11}{3}$

(iv) Find the fraction value of $208\frac{1}{3}\%$

$208\frac{1}{3}\% = 200\% + 8\frac{1}{3}\%$

$= 2 + \frac{1}{12} = \frac{25}{12}$

RY - VII

How to understand the actual meaning of fraction.

$16\frac{2}{3}\% = \frac{1}{6}$ → 1 represents its % result, 6 represent original number/value

$\rightarrow 14\frac{2}{7}\% = \frac{1}{7}$

means $7 \times 14\frac{2}{7}\% = 1$

$\rightarrow 62\frac{1}{2}\% = \frac{5}{8}$

means $8 \times 62\frac{1}{2}\% = 5$

$\rightarrow 37\frac{1}{2}\% = \frac{3}{8}$

means $8 \times 37\frac{1}{2}\% = 3$

RY - VIII

QUESTIONS BASED ON FRACTION

1. If $37\frac{1}{2}\%$ of a number is added with itself then result becomes 1320. Find the original number.

Detailed Method :

Let the original number be x

According to the question,

$x + x \times 37\frac{1}{2}\% = 1320$

$x + x \times \frac{3}{8} = 1320$

$\frac{8x + 3x}{8} = 1320$

$$\frac{11x}{8} = 1320$$

$$x = 1320 \times \frac{8}{11} = 960$$

Fraction Method:

$$37\frac{1}{2}\% = \frac{3}{8} \begin{matrix} \Rightarrow \text{ \% result} \\ \Rightarrow \text{ Orignal Number} \end{matrix}$$

Original number = 8 unit

Result formed = 8 unit + 3 unit

$$\left[8 \times 37\frac{1}{2}\% = 3\right]$$

11 unit $\rightarrow$ 1320

1 unit $\rightarrow$ 120

So, the original number = 8 × 120 = 960

2. If $62\frac{1}{2}\%$ of a number is subtracted from itself then result becomes 6321. Find the original number.

Detailed Solution,

Let the original number = x

A.T.Q,

$$x - x \times 62\frac{1}{2}\% = 6321$$

$$x - x \times \frac{5}{8} = 6321$$

$$\frac{3x}{8} = 6321$$

x = 16856

Fraction method :

$$62\frac{1}{2}\% = \frac{5}{8}$$

$$\left[8 \times 62\frac{1}{2}\% = 5\right]$$

Original number = 8 unit

Result formed = 8 unit – 5 unit

3 units $\rightarrow$ 6321

1 unit $\rightarrow$ 2107

So, original number

= 8 × 2107 = 16,856

3. If $16\frac{2}{3}\%$ of a number is added with itself then result becomes 4956. Find the original number.

Sol. Let the original no. = x

According to the question

$$x + x \times 16\frac{2}{3}\% = 4956$$

$$x + \frac{x}{6} = 4956$$

$$\frac{7x}{6} = 4956$$

x = 708 × 6 = 4248

Alternate:

$$16\frac{2}{3}\% = \frac{1}{6} \begin{matrix} \rightarrow \text{ \% result} \\ \rightarrow \text{ Original number} \end{matrix}$$

Now,

New No = 6 + 1 = 7 unit = 4956

1unit = 708

Original no. = 6 unit = 6 × 708

= 4248

4. If $6\frac{2}{3}\%$ of a number is subtracted from itself then result becomes 5670. Find the original number.

Sol.

$$-6\frac{2}{3}\% = \frac{1}{15} \begin{matrix} \rightarrow \text{ Substract value} \\ \rightarrow \text{ Original number} \end{matrix}$$

New Value = 15 – 1 = 14 unit

= 5670

1 unit = 405

Original value = 405 × 16

= 6480

5. If $11\frac{1}{9}\%$ of a number is added with itself then result becomes 900 find the original number.

Sol. $+11\frac{1}{9}\% = \frac{1}{9} \begin{matrix} \rightarrow \text{ Added value} \\ \rightarrow \text{ Original number} \end{matrix}$

New value = 9 + 1 = 10 unit

= 900

1 unit = 90

Original no. = 90 × 9 = 810

6. What is 20% of 50% of 75% of 70?

Sol. Value = $70 \times \frac{1}{5} \times \frac{1}{2} \times \frac{3}{4}$

$= \frac{21}{4} = 5.25$

7. If 20% of (P + Q) = 40% of (P – Q) then find P : Q

Sol. $\frac{20}{100}(P + Q) = \frac{40}{100}(P - Q)$

P + Q = 2P – 2Q

P – Q = 4P – Q

3Q = 1P

P : Q = 3 : 1

8. What is 20% of 25% of 300 ?

Sol. $300 \times \frac{20}{100} \times \frac{25}{100} = 15$

9. 25% of what number is 36 ?

Sol. Let the number be x

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

$x = 36 \times 4 = 144$

10. If 240 is 20% of a number, then 120% of that numbe will be ?

sol. Let the number be = x

20% of x = 240

$x \times \frac{1}{5} = 240$

x = 1200

Now,

$1200 \times 120\% = 1200 \times \frac{120}{100}$

= 1440

11. If we express $41\frac{3}{17}\%$ as a fraction, then it is equal to :

Sol. $41\frac{3}{17}\% = \frac{700}{17} \times \frac{1}{100} = \frac{7}{17}$

12. If 125% of x is 100, then x is:

Sol. $x \times \frac{125}{100} = 100$

$x = \frac{100 \times 100}{125} = 80$

13. If 50% of (x - y) = 30% of (x + y) then what percent is y of x ?

Sol. $\frac{50}{100}(x - y) = \frac{30}{100}(x + y)$

$50x - 50y = 30x + 30y$

$50x - 30x = 30y + 50y$

$20x = 80y$

$x = 4$

$y = 1$

So, y is $\frac{1}{4} = 25\%$

14. If 64 is added in a number then number becomes $157\frac{1}{7}\%$ of itself. Find the number.

Sol. $157\frac{1}{7}\% = \frac{11}{7}$

$\left[7 \times 157\frac{1}{7}\% = 11\right]$

7 unit — 11 unit

4 unit → 64

1 unit → 16

So, the original number = 7 × 16 = 112

15. If 930 is added in a number then number becomes $444\frac{4}{9}\%$ of itself. Find the original number.

Sol. $444\frac{4}{9}\% = \frac{40}{9}$

$444\frac{4}{9} = 400\% + 44\frac{4}{9}\%$

$= 4 + \frac{4}{9} = \frac{40}{9}$

and $9 \times 444\frac{4}{9}\% = 40$

Original number 9 unit — Formed number 40 unit

+ 31unit → 930

1 unit → 30

So, the original number = 9 × 30 = 270

16. The price of a commodity rise from ₹ 6 per kg to ₹ 7.50 per kg. If the expenditure cannot increase the percentage of reduction in consumption is

Sol. Percentage increase

$= \frac{7.50 - 6}{6} \times 100 = 25\%$

$100 \xrightarrow{+25\%} 125$

$\xleftarrow{-25}$

$\therefore$ Percentage decrease in consumption

$= \frac{25}{125} \times 100 = 20\%$

17. If the length of a rectangle is increased by $37\frac{1}{2}\%$ and its breadth is decreased by 20%. Find the % change in the area.

Sol.

Length	×	Breadth	=	Area	
8	×	5	=	40	+4
11	×	4	=	44	

$\left[37\frac{1}{2}\% = \frac{3}{8}\right] \left[20\% = \frac{1}{5}\right]$

% change in Area = $\frac{4}{40} \times 100$

= 10%

18. If the sides of a square is increased by 40%. Find the % change in its area.

Sol.

Side	Area $(\text{Side})^2$	
5	25	+24
7	49	

$\left[40\% = \frac{2}{5}\right]$

% change in Area = $\frac{24}{25} \times 100 = 96\%$

19. The price of sugar is increased by $16\frac{2}{3}\%$ and; the consumption of a family is decreased by 20%. Find the % change in his expenditure.

Sol.

	Price		Consumption		Expenditure	
$\left[16\frac{2}{3}\% = \frac{1}{6}\right]$	6	×	5	=	30	−2
	7	×	4	=	28	

% change in his expenditure

$= \frac{2}{30} \times 100 = 6\frac{2}{3}\%$

20. The sale of a cinema ticket is increased by $57\frac{1}{7}\%$ and the price of ticket is increased by $16\frac{2}{3}\%$. Find the % change in his revenue.

Sol.

Sale		Price			
7	×	6	=	42	+35
11	×	7	=	77	

$57\frac{1}{7}\% = \frac{4}{7}, \quad 16\frac{2}{3}\% = \frac{1}{6}$

% Change in his revenue

$\Rightarrow \frac{35}{42} \times 100 \Rightarrow 83\frac{1}{3}\%$

21. If one of the sides of a rectangle is increased by 20% and the other is increased by 5%. Find the percent value by which the area changes.

Sol. Area of rectangle = Length × Breadth

Length +20% = $\frac{1}{5}$

Breadth +5% = $\frac{1}{20}$

L		B		Area	
5	×	20	=	100	26
6	×	21	=	126	

Required%= $\frac{26}{100} \times 100$

= 26% ↑ (Increase)

22. If one of the sides of rectangle increased by $37\frac{1}{2}\%$ and the other is decreased by 20% find the percent value by which area changes.

Sol. Area = Length × Breadth

Length = $+37\frac{1}{2}\% = \frac{3}{8}$

Breadth = $-20\% = \frac{1}{5}$

L	B	Area	
8	× 5	= 40	) 4
11	× 4	= 44	↙

Required % = $\frac{4}{40} \times 100 = 10\% \uparrow$ (Increase)

23. A number is first reduced by 20% and then it is increased by 80%. What was the net effect?

Sol. $-20\% = \frac{-1}{5}$, 5 4

$+80\% = \frac{+4}{5}$, 5 → 25 9 → 36

+11

Required % = $\frac{11}{25} \times 100$

= 44% (Increase)

24. The tax imposed on an article is increased by 10% and its consumption decreased by 10%. Find the percentage change in revenue from it.

Sol. I $+10\% = \frac{1}{10}$, 10 11

II $-10\% = \frac{1}{10}$, 10 → 100 9 → 99

−1

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

= 1% (decrease)

25. Two numbers are respectively 20% and 50% more than a third. Now what percentage is the first of the second?

Sol. Let the third number be = 100

I	II	III
120	150	100

Then, $\frac{120}{150} \times 100 = 80\%$

26. Two numbers are respectively 25% and 20% less than a third number. What percent is the first number of the second?

Sol. Let the third number is 100

I	II	III
75	80	100

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

27. If Goutam's height is 10% more than seema's height, by how much percent is seema's height less than of Goutam's?

Sol. Required % = $\frac{10}{(100+10)} \times 100$

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

Alternate:-

Seema's 100

↓ +10

Goutam's 110

Required % = $\frac{10}{110} \times 100$

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

28. Two numbers are respectively 30% and 40% more than a third number. What percentage is the first of the second ?

Sol. Let third number is 100.

Then,

I	II	III
130	140	100

Required% = $\frac{130}{140} \times 100 = 92\frac{6}{7}\%$

29. Two numbers are respectively 20% and 50% less than a third number. What percentage is the first of the second ?

Sol. Let third number is 100

I	II	III
80	50	100

Required% = $\frac{80}{50} \times 100 = 160\%$

30. In a library, 30% of the books are in Hindi. 40% of the remaining are in French and 60% of the remaining are in Spanish. The remaining 8400 books are in English languages. What is the total number of books in library?

Sol. Let the total no. of books = x then,

$$\Rightarrow x \times \left(\frac{100-30}{100}\right) \times \left(\frac{100-40}{100}\right) \times \left(\frac{100-60}{100}\right) = 8400$$

$$\Rightarrow x \times \frac{70}{100} \times \frac{60}{100} \times \frac{40}{100} = 8400$$

x = 50,000

So, the total no. of books = 50,000

Alternate:-

			Total	Remaining
Hindi	→ 30% = $\frac{30}{100} = \frac{3}{10}$	10	10 → 5	7
French	→ 40% = $\frac{40}{100} = \frac{2}{5}$	5	5	3
Spanish	→ 60% = $\frac{60}{100} = \frac{3}{5}$	5 → 125	2 → 21	1
		↓×400	↓×400	
		50,000	8400	

So, the total no. of books = 50,000

31. The price of rice is increased by 40%. If the expenditure on rice has to be kept the same as earlier. Find the ratio between the reduction in consumption and the original consumption?

Sol. $40\% = \frac{40}{100} = \frac{2}{5}$

Initial Price	Final Price
5	7

Cons. 7 $\xrightarrow{-2}$ 5

Required ratio = $\frac{Reduction}{Initial}$

= 2 : 7

Alternate:-

Let the initial expenditure = 100

100

−40% ↓ +40%

140

Required ratio = 40 : 140

= **2 : 7**

32. One third of a number is 82. What will 80% of that number be?

Sol. Let the number = x

$$\frac{1}{3}\times x = 82$$

$$x = 246$$

Required answer

$$= \frac{80}{100}\times 246 = 196.80$$

33. A reduction in the Price of apples enables a person to purchase 3 apples for Rs. 1 instead of Rs. 1.25. What in the % of reduction in Price (approx.)?

Sol.

Apple	Rs.
3	1.25 (Before)
3	1 (Now)

Reduction rate = 1.25 – 1 = .25

$$\% \text{ Decrease} = \frac{.25}{1.25}\times 100 = 20\%$$

34. The ratio of the number of males to that of females in a village is 3 : 2. If 30% of males and 70% of females are educated the ratio of the number of persons educated to uneducated.

Sol. Let the total no. of persons = 100

$$\text{Ratio of } \frac{\text{Males}}{\text{Females}} = \frac{3}{2}$$

5 units = 100

1 unit = 20

3 units = 20 × 3 = 60

2 units = 20 × 2 = 40

	Males		Females	
	60	+	40	= 100
	↓30%		↓70%	
Educated	18	+	28	= 46

Uneducated = 100 – 46 = 54

Educated	:	Uneducated
46	:	54
23	:	27

35. The ratio of the no. of boys and girls in a college is 2 : 3. If 25% of the boys and 30% of the girls are scholarship holders, the percentage of the college students who are not scholarship holders is.

Sol. In such type of question assume data as per your need.

	Boys		Girls	
Ratio of numbers	→ 200	+	300	= 500
	↓+75%		↓+70%	
Not holding Scholarship	→ 150	+	210	= 360

$$\text{Required\%} = \frac{360}{500}\times 100 = 72\%$$

36. In a class, the number of girls is 20% more than that of the boys. The strength of the class is 66. If 4 more girls are admitted to the class. The ratio of the no. of boys to that of the girls is.

Sol. $20\% = \frac{1}{5} = \frac{6}{5} \rightarrow$ Girls

$\rightarrow$ Boys

Boys : Girls

5 : 6

According to question,

5 + 6 units = 66

11 units = 66

1 unit = 6

Hence, Boys = 6 × 5 = 30

Girls = 6 × 6 = 36

The no. of Girls when 4 is admitted = (36+4) = 40

Required ratio= 30 : 40 = 3 : 4

37. The ratio of the number of boys to that of girls in a school is 4 : 1. If 75% of boys and 70% of the girls are scholarship holders, then the percentage of students who do no get scholarship is.

Sol. Let the no. of boys = 400

Let the no. of girls = 100

Total no. of students who do not go scholarship

$$= 400\times\frac{25}{100}, \quad 100\times\frac{30}{100}$$

= 100 + 30 = 130

$$\text{Required\%} = \frac{130}{500}\times 100$$

= 26%

38. If 15% of x is same as 20% of y then $x : y$ is

Sol. According to the question,

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

$$15x = 20y$$

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

$x : y = 4 : 3$

39. Two numbers A and B are such that the sum of 5% of A and 4% of B is $\frac{2}{3}$rd of the sum of 6% of A and 8% of B. The ratio A : B is.

Sol. According to the question,

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

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

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

$$3A = 4B$$

$$\frac{A}{B} = \frac{4}{3}, \qquad A : B = 4 : 3$$

40. In an examination A got marks 10% less than B. B got marks 25% more than C, C got marks 20% less than D. If A got 360 marks out of 500 then D got marks:

Sol. Let the marks obtained by B = 100

According to the question

	A	B	C	D
	90	100	80	100
Ratio of marks	9	10	8	10
	↓×40			↓×40
	360			400

$$\% \text{ of D's marks } \frac{400}{500}\times 100 = 80\%$$

41. In an exam 900 girls and 1100 boys appeared. In which 40% of girls and 50% of the boys passed the exam. Find the % of failed students?

Sol. Girls failed = 100 – 40 = 60%

Boys failed = 100 – 50 = 50%

Total failed students

$$= \frac{3}{5}\times 900 + \frac{1}{2}\times 1100$$

= 540 + 550 = 1090

$$\text{Required\%} = \frac{1090}{2000} \times 100 = 54.5\%$$

42. In an examination there are three subjects Biology, Botany, zoology having max. marks 120, 140, 100 respectively. A students gets 40%, 55%, 45% in Biology Botany, zoology respectively. If he wants to get 60% marks in four subjects then how many marks he must obtain in maths of max. marks 180?

Sol. Total max. marks in four subjects

120+140+100+180 = 540

60% of total max. marks

$$= \frac{3}{5} \times 540 = 324$$

marks obtained in there subjects

$$= 120 \times \frac{2}{5} + 140 \times \frac{11}{20} + 100 \times \frac{9}{20}$$

= 48 + 77 + 45 = 170

marks to be obtained in maths = 324 – 170 = 154

43. The ratio of the number of the males and females in a village is 3 : 2. If 20% males and 25% of females are uneducated the percentage of those who are educated?

Sol. Lets number of males = 300

Number of females = 200

	Males		Females
	300		200
	↓ 80%		↓ 75%
Educated →	240	+	150 = 390

Required%

$$= \frac{390}{(300+200)} \times 100$$

$$= \frac{390}{500} \times 100$$

= 78%

44. If 70% of the students in a school are boys and the number of girls is 540, how many boys are in the school?

Sol. 30% of girls students = 540

1% = 18

70% of boys students

= 70 × 18 = 1260

45. A batsman scored 130 runs which included 5 four and 5 sixes. What percent of his total score did he make by running between the wickets ?

Sol. The batsman scored 5 × 4 + 5 × 6 = 50 runs by fours and sixes respectively. Then runs scored by running.

= 130 – 50 = 80

Required percentage

$$= \frac{80}{130} \times 100 = 61\frac{7}{13}\%$$

46. The Cost of manufacturing of an article as made up of four components A, B, C and D which have a ratio of 3:4:5:6 respectively. If there are respective changes in the cost of +10%, –20%, –30% and +40%, then what would be the percentage change in the cost.

Sol. NOTE- In such type of questions assume any value but ratio should not be changed.

	A	: B	: C	: D
Old Cost →	300	400	500	600
	↓ +10%	↓ –20%	↓ –30%	↓ +40%
New Cost →	330	320	350	840

Total old cost = (300 + 400 + 500 + 600) = Rs. 1800

Total new cost = (330 + 320 + 350 + 840) =Rs. 1840

$$\% \text{ change} = \frac{1840-1800}{1800} \times 100$$

$$= \frac{40}{18} = 2\frac{2}{9}\%$$

47. Goutam invests Rs. 10,000 in some shares in the ratio 2:3:5 which pay dividents of 10%, 25% and 20% (on his investment) for that year respectively. Find the divident income.

Sol. Ratio of shares = $2x : 3x : 5x$

According to question,

$(2x + 3x + 5x) = 10{,}000$

10x = 10,000

Ist share = 2×1000 = 2000

IInd share = 3×1000 = 3000

IIIrd share = 5×1000 = 5000

Divident income

$$= \frac{2000 \times 10}{100} + \frac{3000 \times 25}{100}$$

$$+ \frac{5000 \times 20}{100}$$

= 200 + 750 + 1000 = Rs. 1950

48. The radius of a sphere is 20 cm. Find out its surface area is how much % of its volume?

Sol. S. A = $4\pi r^2$

Volume = $\frac{4}{3}\pi r^3$

Required percentage

$$= \frac{4\pi r^2}{\frac{4}{3}\pi r^3} \times 100 = \frac{3}{r} \times 100$$

$$= \frac{3}{20} \times 100 = 15\%$$

$\therefore$ The required percentage = 15%

49. In a village there are 700 males, 500 females and 800 children. If due to epidemic 20% males, 40% females and 10% children are died. Find the % age of safe population of the village.

Sol. No. of safe males:

$$= \frac{80}{100} \times 700 = 560$$

No. of safe females

$$= \frac{60}{100} \times 500 = 300$$

No. of safe children

$$= \frac{90}{100} \times 800 = 720$$

Total safe population

= 560 + 300 + 720 = 1580

Required %

$$= \frac{1580}{(700+500+800)} \times 100$$

$$= \frac{1580}{2000} \times 100 = 79\%$$

50. The price of a table and chair is Rs. 200 and Rs. 140 respectively. If the price of table and chair is increased by 20% and 30% respectively. Find the net value/price of two dozen tables and 25 chairs.

Sol. Increased price of table

$= 200 \times \frac{120}{100}$ = Rs. 240

Increased prices of chair

$= 140 \times \frac{130}{100}$ = Rs. 182

So value of 24 tables + 25 chairs

= 24×240 +25 ×182

= Rs. 10310.

51. If the numerator of a fraction is increased by 20% and the denominator is decreased by 5% the value of the new fraction becomes $\frac{5}{2}$. The original fraction is.

Sol. Let the fraction = $\frac{x}{y}$

According to the question,

$\Rightarrow \frac{x \times 120}{y \times 95} = \frac{5}{2}$

$\Rightarrow \frac{x}{y} = \frac{5 \times 95}{2 \times 120} = \frac{95}{48}$

52. A fruit seller had some oranges. He sells 60% oranges and still has 280 oranges. Originally he had.

Sol. Required Oranges,

$= \frac{280}{(100-60)} \times 100$

$= \frac{280}{40} \times 100$ = **700 Oranges**

53. A dozen pairs of socks quoted at Rs. 180 are available at discount of 20%. How many pairs of socks can be bought for Rs. 48?

Sol. Price after discount

$= \frac{180 \times 80}{100}$ = 144

Price of 1 pair of socks

= Rs. $\frac{144}{12}$ = 12

Required answer = $\frac{48}{12}$

= **4 pairs**

54. 33% of employees pay tax in the year 2015. Non tax paying employees are 20100. The t otal number of employees are.

Sol. Total no. of employees

$= \frac{20100}{(100-33)} \times 100$

$= \frac{20100}{67} \times 100 = 30{,}000$

55. A box has 1000 blue, 500 red balls, 500 black balls 25% of blue balls and 50% of red balls are taken away, then find the percentage of black balls ?

Sol.

	Blue	Red	Black
Total balls	1000	500	500
	↓25%	↓50%	
Taken out	250	250	

Remaining balls

= (1000 + 500 + 500)–(250+250)

= 1500

Required % of black balls

$= \frac{500}{1500} \times 100 = 33\frac{1}{3}\%$

56. The sum of two numbers is 520. If the bigger number is decreased by 4% and the smaller number is increased by 12% then the numbers obtained are equal. Find the numbers.

Sol. Let the bigger number is a and the smaller number is (520 – a)

According to the question,

$a \times \frac{(100-4)}{100}$

$= (520 - a) \times \left(\frac{100+12}{100}\right)$

$\frac{96a}{100} = (520-a)\frac{112}{100}$

96a = (520 – a)112

13a = 3640, a = 280

Hence the bigger number = 280

smaller number = (520 – 280) = 240

Alternate:-

Let the Bigger no. = x

smaller no = y

According to question,

$x \times \frac{96}{100} = y \times \frac{112}{100}$

$6x = 7y$

$x : y$

7 : 6

13 units = 520

1 unit = 40

Bigger no. = (x)= 7 units

= 7 × 40 = 280

smaller no. (y) = 6 units

= 6 × 40 = 240

57. If two successive years, 80 and 60 students of a school appeared at the final examination of which 60% and 80% passed respectively. The average rate of students passed (in percent) is.

Sol.

	I year	**II year**
Appeared Students →	80	60
	↓60%	↓80%
Passed Students →	48	48

Required % average rate

$= \frac{(48+48)}{(80+60)} \times 100$

$= \frac{96}{140} \times 100 = \frac{960}{14} = 68\frac{4}{7}\%$

58. The population of a village is 30,000. $\frac{1}{6}^{th}$ are females and the rest are males, 5% males and 40% of females are uneducated. What percentage of the whole village are educated?

Sol. No. of females = $30000 \times \frac{1}{6}$

= 5000

No. of males = 30,000 – 5000

= 25,000

No. of educated females

$= 5000 \times \frac{60}{100} = 3000$

No. of educated males

$= 25000 \times \frac{95}{100} = 23750$

Total educated population
= 23750 + 3000 = 26,750

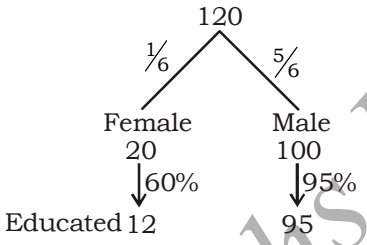
Required % $= \frac{26,750}{30,000} \times 100$

$= 89\frac{1}{6}\%$

Alternate:

$\frac{1}{6} \rightarrow$ Female, $\frac{5}{6} \rightarrow$ male

Let the total no population = 120
(In this question no affect in total population when ask question in percentage)



Total educated = 12 + 95 = 107

Required % = $\frac{107 \times 100}{120}$

$= 89\frac{1}{6}\%$

59. The expense on Rice, Sugar and oil of a family are in the ratio 12 : 17 : 3. The price of these articles are increased by 20%, and 30% and 50% respectively. The total expenses of family on these articles are increased by.

Sol.

	Rice	Sugar	Oil
Old expenses	120	170	30
	↓20%	↓30%	↓50%
	24	51	15

Required %

$= \frac{24 + 51 + 15}{(120 + 170 + 30)} \times 100$

$= \frac{90}{320} \times 100 = 28\frac{1}{8}\%$

60. Due to an increase of 50% in the price of eggs 4 eggs less are available for Rs 24. The present rate of eggs per dozen is.

Sol. Required more money when the price is increased by 50%

$= 24 \times \frac{50}{100} = 12$

Present price = $\frac{12}{4}$ = 3 Rs./egg

Present price of 1 dozen eggs
= 3 × 12 = Rs. 36

61. The sum of the numbers of boys and girls in a school is 300. If the number of boys is P. The number of girls becomes P% of the total number of students. The number of boys is.

Sol. No. of boys = P

No. of girls = (300 – P)

According to the question,

$300 \times \frac{P}{100} = (300 - P)$

3P = 300 – P

4P = 300

P = 75

No. of boys = 75

62. In an exam, 1500 boys and 500 girls appeared 50% of the boys and 40% of the girls passed the examination. The percentage of candidates who failed.

Sol.

	Boys	Girls
	1500	500
	↓50%	↓60%
Failed Candidates →	750	300

Total failed candidates
= 750 + 300 = 1050

Required% = $\frac{1050}{(1500 + 500)} \times 100$

$= \frac{1050}{2000} \times 100 = 52.5\%$

63. 90% of the students in school passed in english, 85%. Passed in Hindi and 375 students passed in both the subjects. If no students failed in both the subjects find the total number of students ?

Sol. Percentage of passed students in both subjects
= (90+85)–100 = 75%
Total no. of students

$= \frac{375}{75} \times 100 = 500$

64. Manisha spents $12\frac{1}{2}\%$ of her salary on item of daily use and 30% of the remainder on house rent. After that she is left with Rs. 4410. How much is her salary?

Sol. $12\frac{1}{2}\% = \frac{1}{8}$, $30\% = \frac{3}{10}$

Intitial	Final
8	7
× 10	× 7
80	49
↓90	↓90
7200	4410

Hence required salary 7200

65. Three sets of 400, 500 and 600 students appeared for an examination and the pass percentage was 100, 90 and 80 respectively. The pass percentage of the whole set is.

Sol.

	I	II	III
Appeared students →	400	500	600
	↓100%	↓90%	↓80%
Pass Students →	400	450	480

Required % = $\frac{400 + 450 + 480}{400 + 500 + 600} \times 100$

$= \frac{1330}{1500} \times 100 = 88\frac{2}{3}\%$

66. A man had a certain amount with him. He spent 30% of that to buy an article and 10% of the remaining on transport, then he donated Rs. 60. If he is left with 1200. The amount he spent on transport is :

Sol. Let the total amount = x

According to the question,

$$x \times \frac{70}{100} \times \frac{90}{100} = (60 + 1200)$$

$$x \times \frac{7}{10} \times \frac{9}{10} = 1260$$

Total amount = 2000

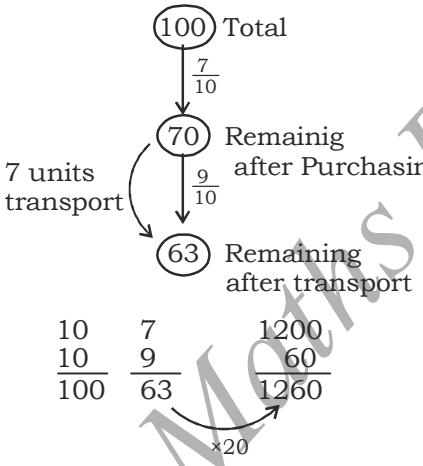
Amount spent on transport

$$= 2000 \times \frac{70}{100} \times \frac{10}{100} = 140$$

Alternate:-

$$30\% = \frac{3}{10}, \quad 10\% = \frac{1}{10}$$

Total amount = 100 units



1 unit = 20

7 units = 20 × 7 = 140

67. Amit had a certain amount with him. He spent 20% of that to buy a car and 5% of the remaining on maintenance of a bike. Then he gifted 120 Rs. If he is left with Rs. 1400. Then find the total amount ?

Sol. Let the total amount = x

According to the question.

$$x \times \frac{80}{100} \times \frac{95}{100} = (120 + 1400)$$

$$x \times \frac{4}{5} \times \frac{19}{20} = 1520$$

x = Rs .2000

Alternate:-

$$20\% = \frac{1}{5}, \quad 5\% = \frac{1}{20}$$

5 ×20 100 ↓×20 Rs. 2000

4 ×19 76 ×20

1400 +120 1520

RY - IX

68. A number is increased by R%. To get back to the original number, It is to be reduced to Initial value by what % ?

Sol. $\frac{P \times R}{100} \rightarrow$ increased value

$$\rightarrow P + \frac{PR}{100} = P\left(\frac{100 + R}{100}\right)$$

Required answer

$$= \left(\frac{R}{100 + R} \times 100\right)\% = \frac{100R}{100 + R}\%$$

69. If Ram's salary is 30% less than that of shyam then how much percent is shyam's salary more than that of Ram

Sol. Shyam 100 unit

↓ –30 unit

Ram 70 unit

Ram – 70 +30

Shyam – 100

$$\frac{30}{70} = \frac{3}{7}$$

$$42\frac{6}{7}\% \qquad \left[\because \frac{1}{7} = 14\frac{2}{7}\%\right]$$

70. If Sohan's salary is 25% more than that of mohan, then how much percent is mohan's salary less than that of sohan ?

Sol. Mohan 100

↓ +25

Sohan 125

Sohan 125 -25

Mohan 100

$$\frac{25}{125} = \frac{1}{5} = 20\%$$

71. The price of sugar rises by 20% by how much percentage should the consumption of sugar be reduced so that the expenditure doesn't change ?

Sol. Required percentage decrease

$$= \frac{\text{Increase}}{\text{Increase} + 100} \times 100$$

$$= \frac{20}{100 + 20} \times 100$$

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

Alternate:-

$$+20\% = \frac{+1}{5}$$

	Old	New
Price	5	6
Consumption	6	5

(–1)

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

72. If food prices go up by 10% by how much should a man reduce his consumption so as not to increase his expenditure ?

Sol. Required answer

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

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

Alternate:-

$$+10\% = \frac{+1}{10}$$

	Old	New
Price	10	11
Consumption	11	10

(–1)

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

73. In the new budget, the price of kerosene oil rose by 25%. By how much percentage must a person reduce his consumption of kerosene oil so that his expenditure does not increase?

Sol. Required reduction in consumption

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

where $x = 25$

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

Alternate:-

$$+25\% = \frac{+1}{4}$$

	Old	New
Price	4	5
Consumption	5	4
		−1

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

74. The price of certain items is increased by 15% If a consumer wants to keep his expenditure on the item the same as before, how much percent must he reduce his consumption of that item.

Sol. If the price of a commodity increases by R%, then reduction in consumption, not to increase the expenditure is given by –

$$\left(\frac{R}{100+R} \times 100\right)\% = \frac{15}{100+15} \times 100$$

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

Alternate:-

$$+15\% = \frac{+3}{20}$$

	Old	New
Price	20	23
Consumption	23	20
		−3

$$\text{Reduced \%} = \frac{3}{23} \times 100$$

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

75. If the price of a commodity is increased by 50% by what fraction must its consumption be reduced so as to keep the same expenditure on its consumption?

Sol. Required fractional decrease

$$= \frac{R}{100+R} = \frac{50}{100+50} = \frac{1}{3}$$

76. If the price of rice be raised by 25%, the percent by which a house-holder must reduce the consumption of rice so as not to increase his expenditure on rice is

Sol. Percentage decrease

$$= \frac{25}{125} \times 100 = 20\%$$

77. If the duty of an article is reduced by 40% of its present rate, by how much percent must its consumption increase in order that the revenue remains unaltered ?

Sol. Required increase percent

$$= \frac{40}{100-40} \times 100 = \frac{200}{3}$$

$$= 66\frac{2}{3}\%$$

Alternate:-

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

	Old	New
Price	5	3
Consumption	3	5
		+2

$$\text{Increase \%} = \frac{2}{3} \times 100 = 66\frac{2}{3}\%$$

78. Price of a commodity has increased by 60%. By what percent must a consumer reduce the consumption of the commodity so as not to increase the expendtiure?

Sol. If the reduction in consumption be x%

then $60 - x - \frac{60x}{100} = 0$

$$60 - x - \frac{3x}{5} = 0$$

$300 - 5x - 3x = 0$

$8x = 300$

$$x = \frac{300}{8} = 37.5\%$$

Alternate:-

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

	Old	New
Price	5	8
Consumption	8	5
		−3

$$\text{Reduced \%} = \frac{3}{8} \times 100 = 37.5\%$$

79. The price of petrol is increased by 25%. By how much percent a car owner should reduce his consumption of petrol so that the expenditure doesn't change?

Sol. Required percent

$$= \frac{25 \times 100}{125} = 20\%$$

RY - X

80. A number is increased by 20% and then it is decreased by 20%. Find the net increase or decrease percent?

Sol. Change in percentage

$$\left(20 - 20 - \frac{20 \times 20}{100}\right)\%$$

$\left(\frac{-400}{100}\right)\% = -4\%$, So 4% decrease

(–ve = Decrease, +ve = Increase)

Alternative

20%↑	5	6
20%↓	5	4
	25	24
		−1

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

4% decrease

81. A number is first decreased by 20%. The decreased number is then increased by 20%. The resulting number is less than the original number by 30. Find the original number ?

Sol. $\left(-20+20-\frac{20\times20}{100}\right) = -4\%$

If the number be x then

4% of x = 30

$x \times \frac{4}{100} = 30$

x = 750

Alternative :

-+20% –20%

5 4

5 6

25 24

×30 30

–1

×30

750

So the original number 750

82. If a number is increased by 20% and the resulting number is again increased by 20%, what percent is the total increase?

Sol.

20% ↑ → 5 6

20% ↑ → 5 6

25 36

11

Required % $= \frac{11}{25}\times100$

= +44% gain

83. The price of an article is increased by 10% but the daily sale of the article is decreased by 10% the net effect on the daily sale receipts is?

Sol. +10% –10%

10% ↑ → 10 11

10% ↓ → 10 9

100 99

–1

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

= 1% loss

84. If price of a book is first decreased by 20% and then increased by 25% the next change in the price of the book will be.

Sol. $-20\% = \frac{1}{5}$, 5 4

$+25\% = \frac{1}{4}$, $\frac{4}{20}$ $\frac{5}{20}$

Required % = No change in the Price

85. The price of an article was first increased by 20% and then again increased by 10%. If the last increased price is Rs. 99, the original price was.

Sol. I $+20\% = \frac{1}{5}$, 5 6

II $+10\% = \frac{1}{10}$, $\frac{10}{50}$ $\frac{11}{66}$

$\times\frac{3}{2}$ $\times\frac{3}{2}$

75 99

So, the original price is 75

86. The price of a certain article was raised by 10% in India. The consumption of the same article was increased from 200 tons to 225 tons. By how much percent will the expenditure on the article rise in the Indian economy?

Sol. % Increase in consumption

$= \frac{225-200}{200}\times100 = 12.5\%$

Now total rise in economy

$= 10+12.5+\frac{10\times12.5}{100} = 23.75\%$

Alternate:

Let the price **100**

↓ +10%

110

↓ +12.5%

123.75

Final rise of economy = 23.75%

87. If the length, breadth and height of a cube are decreased, Increased and increased by 5%, 5% and 20% respectively. then what will be the impact on the volume of the cube (in percentage terms)?

Sol. 5% = $\frac{1}{20}$, 20% = $\frac{1}{5}$

	Old		New
Length →	20	:	19
Breath →	20	:	21
Height →	5	:	6
Volume	2000		2394

+394

% change in volume

$= \frac{394}{2000}\times100 = \frac{394}{20} = 19.7\%$

88. While measuring the base of triangle it has been taken in 40% excess and its height was measured 40% less. Find the percentage change in its area?

Sol. Percentage change in area

$= +40-40-\frac{40\times40}{100} = -16\%$

Hence there is a decrease of 16% in area.

Atternatively:

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

	Initial	Final
Base	5	7
Height	5	3
	25	21

Percentage decrease

$= \frac{25-21}{25}\times100$

= 16%

89. Ram pays 50% income tax on this tax he has to pay a surcharge of 20%. Thus, the net tax rate he has to pay is.

Sol. Net tax rate = $50+\frac{50\times20}{100}$

= 50+10

= **60%**

90. Ankur pay 30% income tax on this tax he has to pay a surcharge of 10%. Thus the net tax rate he has to pay is.

Sol. Net Tax rate = $30+\frac{30\times10}{100}=33\%$

91. The price of an article was increased by P%. Later the new price was decreased by P%. If the latest price was Rs.1, then the original price was.

Sol. P% = $\frac{P}{100}$

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

According to the question,

(100 + P) (100 – P) units = Rs. 1

$(10000 - P^2)$ units = Rs. 1

1 unit = $\frac{1}{10,000-p^2}$

Original Prize = $\left(\frac{10000}{10000-p^2}\right)$

RY - XI

92. Mohan saves 14% of his salary while Sohan saves 22%. If both get the same salary and Sohan saves Rs. 1540, What is the savings of Mohan?

Sol. Salary of Sohan

= $\frac{1540}{22}\times100$ = 7000

Salary of Mohan = Salary of Sohan

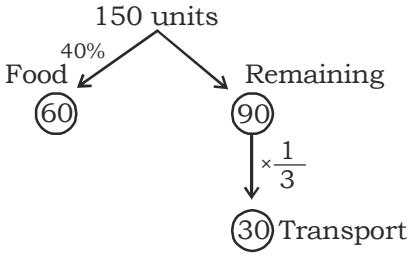
Hence salary of Mohan = 7000

Savings of Mohan

= $7000\times\frac{14}{100}$ = 980

93. A man spents 40% of his monthly salary on food and one third of the remaining on transport. If he saves Rs.9000, than find his monthly salary ?

Sol. Let total salary = 150 units



Remaining Salary after expenditure = 150–(60+30)

= 60 units

According to the question,

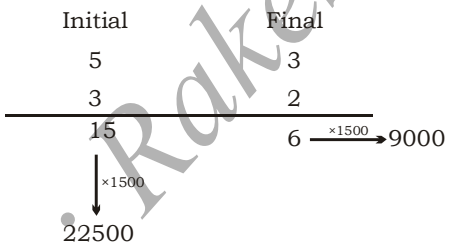
60 units → 9000

1 unit → 150

Monthly salary= 150×150

= Rs. 22,500

Alternate:-



94. A man spents $12\frac{1}{2}\%$ of his salary on item of daily use and 30% of the remainder on house rent. After that he is left with Rs. 2940. How much is his salary?

Sol. $12\frac{1}{2}\%=\frac{1}{8}$, $30\%=\frac{3}{10}$

Initial	Final
8	7
×10	×7
80	49
×60	×60
4800	2940

So required salary = 4800

95. If the total monthly income of 12 person is 72,000 and the income of one of them is 120% of the average income, then his income is.

Sol. Average income = $\frac{72,000}{12}$

= 6000

Hence Required Income

= $6000\times\frac{120}{100}$ = 7200

96. If the monthly salary of a employee is increased by $2\frac{2}{3}\%$, he gets 72 rupees more. His monthly salary is?

Sol. $2\frac{2}{3}\%=\frac{8}{3}\%$

Let the monthly salary = x

According to question,

$x\times\frac{8}{3\times100}=72$

x = 2700

So, monthly salary = Rs. 2700

97. A man spents 75% of his income. His income increased by 20% and he increased his expenditure by $6\frac{2}{3}\%$. His savings will then be increased by.

Sol.

Income	Exp.	Savings
100	75	25
↓+20%	↓$+6\frac{2}{3}\%$	↓
120	80	40

New saving = New Income – Expenditure

= 120 – 80 = 40

Required % = $\frac{40-25}{25}\times100$

= 15 × 4 = 60%

98. A man spents 75% income. His income increased by 20% and his expenditure also in creases by 10%. The percentage of increses in his savings is.

Sol.

Income	Exp.	Savings
100	75	25
↓+20%	↓+10%	↓
120	82.5	37.5

Required % = $\frac{37.5-25}{25}\times100$

= $\frac{12.5}{25}\times100$ = 50%

99. A clerk received an annual salary of Rs. 3660 in the year 2015. This was 20% more than his salary is 2014. What was his salary in 2014 ?

Sol. $+20\% = \frac{1}{5}$

Year 2014	Year 2015
5	6
↓×610	↓×610
(3050)	3660

Hence required salary = 3050

100. Ankur's salary is increased by 20% this year. If his present salary is Rs. 12,600, than find the last year salary?

Sol. Required last year salary

$$= \frac{12,600}{(100+20)} \times 100$$

$$= \frac{12,600}{120} \times 100 = 10,500$$

Alternate:-

$+20\% = \frac{1}{5}$

5	6
↓×21,00	↓×2100
(10500)	12600

Required salary = 10,500

101. Vipin spents 75% of his income and saves the rest of his income if his income increased by 40% and he increases his expenditure by 36%. Then the increase in savings.

Sol.

Income	**Exp.**	**Savings**
100	75	25
↓+40%	↓+36%	↓+13
140	102	**38**

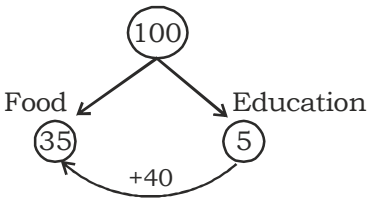
Required %= $\frac{38-25}{25} \times 100$

$= \frac{13}{25} \times 100 = 52\%$

102. Seema spents 35% of her salary on food and 5% of salary on children's education. In january 2016, she spent Rs. 17,600 on these two items. Her salary for that month is.

Sol. Lets total salary of seema = 100 untis

According to the question,



40 units = 17,600

1 unit = $\frac{17600}{40} = 440$

100 units = 440 × 100 = 44,000

103. Out of his total income, Ankur spents 20% on house rent and 70% of the rest on house hold expenses. If he saves Rs. 7200 what is his total income ?

Sol. $20\% = \frac{1}{5}$,

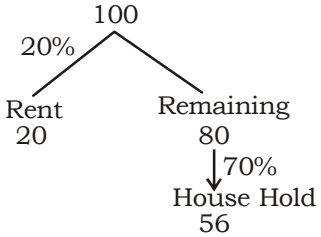
$70\% = \frac{7}{10} \begin{matrix} \rightarrow \text{Expenditure} \\ \rightarrow \text{Income} \end{matrix}$

Initial	Final
5	4
×10	×3
50	12
↓×600	↓×600
30,000	7200

Hence Total Income = 30,000

Alternate:-

Let the total income = 100



Total expenditure = 20 + 56 = 76

Saving = 100 – 76 = 24 units

24 units → 7200

1 unit → 300

Then Total income

= 100 × 300 = 30,000

104. The total income of A, B and C be Rs. 333. If they spends 80%, 85%, and 75%. respectively and the ratio of their savings be 7:6:9. Then find the income of B.

Sol.

	A	B	C
spend% →	80	75	75
saving% →	20	15	25

According to question,

20% of A = 7R

$A \times \frac{1}{5} = 7R$

A = 35R

15% of B = 6 R

$B \times \frac{3}{20} = 6\ R$

B = 40R

25% of C = 9R

$C \times \frac{1}{4} = 9R$

C = 36 R

Now,

35R + 40R + 36R

= 333

111R = 333

R = 3

Income of B = 40R

= 40 × 3 = 120

105. Jony saves 30% of his monthly salary. If his monthly expenditure is Rs. 7000 then his monthly savings is.

Sol. Let the salary = 100 units

Savings = 30%

Savings $= 100 \times \frac{30}{100}$

= 30 units

Expenditure=100 – 30

= 70 units

According to the question,

70 units = Rs. 7000

1 unit = Rs. 100

Saving 30 units = 100 × 30

= 3000

RY - XII

106. A reduction of 20% in the Price of Rice enables a Purchase to obtain 8kg more Rice for Rs. 160. Then the Price Per kg before reduction was

Sol. Let the original Price of Rice be Rs. x Per kg

Reduced Price

Rs. $\frac{80x}{100}$ = Rs. $\frac{4x}{5}$ Per kg

According to the question

$$\frac{160}{4x/5} - \frac{160}{x} = 8$$

$$\frac{40\times5}{x} - \frac{160}{x} = 8$$

$$\Rightarrow \frac{200}{x} - \frac{160}{x} = 8$$

$$\frac{40}{x} = 8 \Rightarrow x = \frac{40}{8} = 5 \text{ Per kg.}$$

Alternate:-

$$-20\% = \frac{1}{5}$$

	Initial	Final
Price	5	4
Consumption	4	5

1

1 units = 8

Now,

Initial consumption = 4 units = 4 × 8 = 32 kg

Initial prize = $\frac{160}{32}$ = ₹ 5 kg

107. A reduction of 25% in the Price of sugar enables a person to buy 10 kg more sugar for Rs. 600. The reduced Per kg Price of Sugar is

Sol. Let the original Price of Sugar Per kg = x Rs.

New Price of Rice Per kg

= $\frac{3x}{4}$ Rs.

$$\frac{600}{3x/4} - \frac{600}{x} = 10$$

$$600\left(\frac{4}{3x} - \frac{1}{x}\right) = 10$$

$$\Rightarrow 600\left(\frac{4-3}{3x}\right) = 10$$

$$\frac{600}{3x} = 10 \Rightarrow x = \frac{600}{30} = \text{Rs. } 20$$

$$\text{New Price} = \frac{3x}{4} = \frac{3\times20}{4}$$

= 15 Rs/kg

Alternate:-

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

	Initial	Final
Price	4	3
Consumption	3	4

1

1 unit = 10

Now,

Final consumption = 4 units = 4 × 10 = 40

Final Price = $\frac{600}{40}$ = ₹ 15 kg

108. A reduction of 20% in the Price of an orange enables a man to buy 10 oranges more for Rs 54. The reduced Price of apples Per dozen is

Sol. Let the original Price of oranges be x Rs./dozen

$\therefore$ New Price = $\frac{4x}{5}$ /dozen

$$\frac{54}{\frac{4x}{5}} - \frac{54}{x} = \frac{10}{12}$$

$$54\left(\frac{5}{4x} - \frac{1}{x}\right) = \frac{5}{6}$$

$$54\left(\frac{5-4}{4x}\right) = \frac{5}{6} \Rightarrow \frac{54}{4x} = \frac{5}{6}$$

$$\Rightarrow 4x = \frac{54\times6}{5}$$

$$\therefore \frac{4x}{5} = \frac{54\times6}{5\times5} = \text{Rs. } 12.96$$

Alternate:-

$$-20\% = \frac{-1}{5}$$

	Original	New
Price	5	4
Quantity	4	5

1

1 unit=10 orange = $\frac{10}{12}$ dozens

1 unit = $\frac{5}{6}$ dozens

New quantity = $5 \times \frac{5}{6}$

= $\frac{25}{6}$ dozens.

New price = $\frac{54}{25/6} = \frac{54\times6}{25}$

= 12.96

109. When the Price of Rice decreased by 10% of a man could by 1 kg more Rice for Rs. 270. Then the orginal Price of Rice Per kg is.

Sol. Let the orginal Price of Rice be Rs x/kg

New Price = Rs. $\frac{9x}{10}$ /kg

$$\frac{270}{\frac{9x}{10}} - \frac{270}{x} = 1$$

$$\frac{300}{x} - \frac{270}{x} = 1$$

$$\Rightarrow \frac{30}{x} = 1$$

$\Rightarrow x$ = 30Rs/kg

Alternate:-

$$-10\% = \frac{1}{10}$$

	Original	New
Price	10	9
Quantity	9	10

+1

1 unit = 1 kg

Then,

Original quantity = 9 units = 9 × 1 = 9 kg

original price = $\frac{270}{9}$

=₹ 30 kg

110. A book consists of 30 pages, 25 lines on each page and 35 characters on each line. If this content is written in another book consisting of 30 lines and 28 characters per line, then the required no. of pages will how much percent greater than the previous pages?

Sol. Let no. of new pages be P_2 then,

$30\times25\times35 = P_2 \times 30 \times 28$

$P_2 = \frac{125}{4} = 31.25$

$\Rightarrow$ P2 = 32 pages (pages will always be integers)

so, required percentage

$= \frac{2}{30}\times100$

= 6.66%

111. If the price of sugar is decreased by 20%, a person can buy 2kg more sugar from 360 rupees. Find the original and present price of sugar per kg.

Sol. $-20\% = \frac{1}{5}$

	Original	Present
Price	5	4
Quantity	4	5

1 unit = 2kg

original quantity = 4 units

= 4 × 2 = 8kg

Present quantity = 5 units

= 5 × 2 = 10kg

original price = $\frac{360}{8}$

= ₹ 45 kg

present price = $\frac{360}{10}$

= ₹ 36 kg

112. A man multiplied a no. by $\frac{7}{4}$ instead of $\frac{3}{5}$. Find the % change in revenue.

Sol. In such type of questions let a number which is exactly divisible of 5 and 4 means LCM of (5, 4) = 20

✓ $\frac{3}{5}\times20 = 12$

× $\frac{7}{4}\times20 = 35$ } +23

Increase % = $\frac{23}{12}$ × 100 = $191\frac{2}{3}\%$

113. A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. What is the % error in the calculation?

✓ $\frac{5}{3}\times15 = 25$

× $\frac{3}{5}\times15 = 9$ } −16

Let the number = (LCM of 5, 3) = 15

% Error = $\frac{16}{25}\times100 = 64\%$

(Decrease)

114. In an examination a students got 32% marks and failed by 4 marks. while an another students got 35% marks and got 5 marks more than pass marks find the maximum marks in the examination

Sol. Let the max marks be = x

According to question

(32% of x) + 4 = (35% of x) –5

3% of x = 9

$x \times \frac{3}{100} = 9$

$x = 9\times\frac{100}{3}$

max marks = 300

Alternative:-

32%	–4
35%	+5
3%	9

3% → 9

1% → 3

100% = 3 × 100 = 300

max. marks = 300

115. In an examination the first student got 28% marks and failed by 12 marks. While in the same examination the second students got 30% marks and failed by 6 marks find the maximum marks in the examination and also find minimum pass marks.

Sol. Let x be the max. marks

then pass marks =

(28% of x) + 12 = (30% of x) + 6

2% of x = 6

$2\times\frac{x}{100} = 6$

max. marks (x) = $\frac{6}{2}\times100 = 300$

Pass marks = $\frac{30}{100}\times300 + 6$

= 96

116. The marks of Jony in chemistry are 60% of the marks in mathematics and marks in mathematics are 60% of the marks in physics. How many marks he got in Chemistry. If the marks in these three subjects are 147 in all?

Sol.

Chemistry	:	Maths	Maths	:	Physics
60		100	60		100

Chemistry	:	Maths	Maths	:	Physics
3	:	5	3	:	5

After combining the ratio

Chemistry	Maths	Physics
$9x$	$15x$	$25x$

According to the question

$9x+15x+25x = 147$

$49x = 147$

$x = 3$

marks in chemistry = 9 × 3

= 27

117. In an exam a students got 32.2% marks and he was failed by 28 marks. While an another student got 45% marks and he passed getting 36 marks more than minimum marks required to pass. Find the minimum marks % required to pass in the exam?

Sol.

$$\begin{array}{lll} & 32.2\% & -28 \\ & 45\% & +36 \\ \text{Diff.} & 12.8\% & 64 \quad \text{marks} \end{array}$$

$$\% = \frac{64}{12.8} = 5 \text{ marks}$$

$$\% \text{ marks} = 32.2 + \frac{28}{5}$$

$$= 32.2 + 5.6 = 37.8\ \%$$

118. Jony scores 80% in Geography and 66% in History and the max. marks of both the papers are 100. What percent does he score in maths which is of 200 marks. If he scores 80% marks in all the three subjects.

Sol. Marks in Geography = 80 out of 100

Marks in History = 66 out of 100

Marks obtained in all subject

$$= \frac{80}{100} \times 400 = 320$$

So marks obtained in maths

= 320–(80 + 66)

= 174 out of 200

$$\text{Required\%} = \frac{174}{200} \times 100 = 87\%$$

119. A students has to secure 40% marks to pass the exam. if he gets 80 marks and fails by 40 marks. Than find the maximum marks set for the examination.

Sol. Passing% = 40%

he gets 80 marks and fails by 40,

then 40% = 120 marks

1% = 3 marks

max. marks = 100%

= 100 × 3 = 300

120. A student has to secure 40% marks to get through. If he gets 40 marks and fails by 40 marks, then find the maximum marks set for the examination.

Sol. 40% is equal to = 40 + 40

40% = 80

1% = 2

Max. marks = 2 × 100 = 200

121. A candidate scores 25% and fails by 30 marks while another candidate who scores 50% marks gets 20 marks more than the minimum required marks to pass the examination. Find the maximum marks for the exmaination.

Sol. If he gets $\begin{array}{lll} & 25\% & -30 \\ - & 50\% & +20 \\ & 25\% & 50 \end{array}$

25% = 50

1% = 2 marks

$$\text{passing\%} = 25\% + \frac{30}{2}\% = 40\%$$

Max. marks = 200

122. When Ravi scores 53% and fails by 5 marks while Sandeep who scores 63% marks, gets 10 marks more than the minimum required marks to pass the examination. Find the passing percentage ?

Sol. $\begin{array}{lll} \text{Ravi} & 53\% & -5 \\ - & 63\% & +10 \\ \text{Sandeep} & 10\% & 15 \end{array}$

10% = 15

$$1\% = \frac{3}{2}$$

$$\text{Passing \%} = 53 + \frac{5}{3/2} = 56\frac{1}{3}\%$$

123. A company give 12% commission to his salesman on total sales and 1% bonus on the sales over RS. `15000, If the salesman deposit Rs. 52,350 after deducting his earning from total sales. Find total sales.

Sol: Let the total sales = x

$$\text{Earning} \Rightarrow x \times \frac{12}{100} + (x - 15000) \times \frac{1}{100}$$

$$\frac{12x}{100} + \frac{x}{100} - 150$$

$$\frac{13x}{100} - 150$$

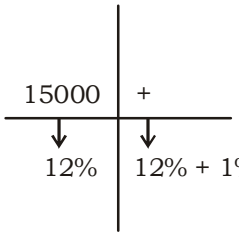
ATQ Total sales – earning = 52,350

$$x - \left(\frac{13x}{100} - 150\right) = 52{,}350$$

$$x - \frac{13}{100}x + 150 = 52350$$

$$\frac{87x}{100} = 52{,}200 \quad x = \text{Rs. } 60{,}000$$

Alternate:-



Let 13% commission of total sales

Then, earning = $15000 \times \frac{1}{100}$

= 150

deposite Rs. after deducting earning

= 52,350 – 150 = 52,200

87% of x = 52,200

$$x \times \frac{87}{100} = 52{,}200$$

Total sales x = 60,000

RY - XIV

124. If the annual increase in the population of a town is $6\frac{1}{4}\%$ and the present number of people is 4096. What will the population be in 3 years ?

Sol. $6\frac{1}{4}\% = \frac{1}{16}$

Successive increase

16	17
16	17
16	17
4096	4913

So, after 3 years the population will be 4913.

125. The population of a village is 8000. If the males and females are increased by 6% and 10% respectively. Then population will become 8600. Find the number of females at present?

Sol. Increased Population = 8600 – 8000 = 600

$$\text{Increased\%} = \frac{600}{8000} \times 100$$

$$= 7\frac{1}{2}\%$$

Male 6% Female 10%

$7\frac{1}{2}\%$

$\frac{5}{2}\%$ $\frac{3}{2}\%$

5 : 3 $= 8 \xrightarrow{\times 1000} 8000$

$\times 1000$

3000

8 Units = 8000

1 Unit = 1000

3 Unit = 3000

Therefore, number of Females = 3000

Alternate:-

8000

Male 6% Female 6% + 4%

$\Rightarrow 8000 \times \frac{6}{100} = 480$

$\Rightarrow$ 8600–8000 = 600

$\Rightarrow$ Remaining = 600 – 480 = 120

$\Rightarrow$ 4% of female = 120

$\Rightarrow$ Females $\times \frac{4}{100} = 120$

Females = 3000

Males = 5000

126. The population of a town is 20,000. It increases by 20% during the first year. During the second year it decreases by 10% and increased by 30% during the third year. What will the population be after 3 years?

Sol. I II III

+20% –10% +30%

$+\frac{1}{5}$ $-\frac{1}{10}$ $+\frac{3}{10}$

Before	After
5	6
10	9
10	13
500	702
$\times 40$	$\times 40$
20000	**28,080**

127. The population of the mukherjee nagar is 10,000 at this moment. If increases by 10% in the first year, however in the second year, due to immigration the population drops by 5%. Find the population at the end of the third year. In in the third year the population increases by 20%.

Sol. The population of mukherjee nagar = 10,000

New population

$$= 10{,}000 \times \frac{110}{100} \times \frac{95}{100} \times \frac{120}{100}$$

= 12,540

Alternative:

I II III

+10% –5% +20%

$+\frac{1}{10}$ $-\frac{1}{20}$ $+\frac{1}{5}$

Before	After
10	11
20	19
5	6
1000	1254
$\times 10$	$\times 10$
At present Population → 10,000	12540

128. The population of a village was 9600. In a year with the increase in population of males by 8% and that of females by 5%, the population of the village become 10272. What was the number of males in the village before increase ?

Sol.

9600

Male Female

5% + 3% 5%

$$= \frac{9600 \times 5}{100} = 480$$

Increase population

= 10272 – 9600

= 672

Now, Remaining = 672 – 480

= 192

Then,

3% Female = 192

Male $\times \frac{3}{100} = 192$

Male = 6400

Female = 9600 – 6400 = 3200

129. If the population of a town is 64000 and its annual increase is 10% then its correct population at the end of 3 years will be.

Sol. $+10\% = \frac{1}{10}$

	Before	After
I[st] year →	10	11
II[nd] year →	10	11
III[rd] year →	10	11
	1000	1331
	×64 ↓	×64 ↓
	64,000	85,184

So after 3 years the population will be 85,184

130. The population of a village has increased annually at the rate of 25%. If at the end of 3 years it is 10,000, the population in the beginning of the first year was...

Sol. $+25\% = \frac{1}{4}$

I year →	4	5
II year →	4	5
III year →	4	5
	64	125
	×80 ↓	×80 ↓
	5120	10,000

After 3 year population = 10,000

The population at the begining of the first year was = 5120

131. Present population of a village is 67600. It has been increasing annually at the rate of 4%. What was the population of the village two years ago?

Sol. $+4\% = \frac{1}{25}$

I year →	25	26
II year →	25	26
	625	676
	×100 ↓	×100 ↓
	62500	67600
		Present Population

So, the population of the village two years ago was 62,500.

132. If the annual increase in the population of town be 4% and the present population be 17,576,?

Sol. $+4\% = \frac{1}{25}$

	Before	After
I year →	25	26
II year →	25	26
III year →	25	26
	15,625	17,576
	×1 ↓	×1 ↓
	15,625	17,576
		Present Population

So, the population three years ago was 15625.

133. The present population of a city is 1,80,000. If it increases at the rate of 10% per annum, its population after 2 years will be.

Sol. $10\% = \frac{1}{10}$

	Before	After
I year →	10	11
II year →	10	11
	100	121
	×1800 ↓	×1800 ↓
	1,80,000	217800
	Current Population	

So, after 2 year the population will be 2,17,800.

134. The population of a town is 8000. It increases by 10% during the first year and by 20% during the second year. What is the population after two years?

Sol. I year, $+10\% = \frac{1}{10}$

II year, $+20\% = \frac{1}{5}$

	Before	After
I[st] year →	10	11
Ii[nd] year →	5	6
	50	66
	×160 ↓	×160 ↓
	8000	10,560

So, after two years the population will be 10,560.

135. The population of a village is 25,000. One fifth of all are female and the rest are males. 5% of males and 40% of females are uneducated. What percentage on the whole are educated.

Sol. Total population = 25,000

$\frac{1}{5}^{th}$ female $= \frac{1}{5} \times 25{,}000$

$= 5000$

Then males = 20,000

5% of 20,000 males = 1000

40% of 5000 female = 2000

So, the educated population = Total population – Uneducated

= 25,000 – 3000 = 22,000

So, the educated populatio is 22,000

Required % $= \frac{22000}{25000} \times 100$

= 88%

136. The population of town is 10,000. It increases by 10% during the first year. During the second year, it decrease by 20% and increased by 30% during the third year. What is population after 3 years ?

Sol.

I	II	III
+10%	–20%	+30%
$\frac{1}{10}$	$\frac{1}{5}$	$\frac{3}{10}$

	Before	After
I[st] year →	10	11
II[nd] year →	5	4
III[rd] year →	10	13
	500	572
	×20 ↓	×20 ↓
	10,000	11440

So, after 3 years population be 11440

137. A district has 64,000 inhabitants. If the population increases at the rate of $2\frac{1}{2}\%$ per annum, the number of inhabitants at the end of 3 years will be.

Sol. $+2\frac{1}{2}\% = \frac{1}{40}$

	Before	After
I year	40	41
II year	40	41
III year	40	41
	64,000	68921
	×1	×1
	64,000	**68,921**

So, the number of inhabitants at the end of 3 years will be 68,921.

138. The population of a town increased every year by 4%. If its present population is 50,000, then after 2 years it will be.

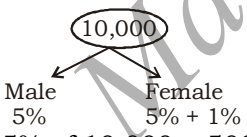
Sol. $4\% = \frac{1}{25}$

	Before	After
I year	25	26
II year	25	26
	625	676
	×80	×80
	50,000	54,080
	Present Population	

So, after two year the population will be 54,080.

139. The population of a town is 10,000. If the males increases by 5% and the female by 6%. The population will be 10540. How many females are there?

Sol.



5% of 10,000 = 500

Increase population

= 10540 – 10000 = 540

Remaining = 540 – 500 = 40

1% of female = 40

Population of Female

= 40 ×100 = 4000

Males = 6000

140. The population of a town 2 years ago was 62,500. Due to migration to big cities, it decreases every year at the rate of 4%. The present population of town is.

Sol. $-4\% = \frac{1}{25}$

	Before	After
I year	25	24
II year	25	24
	625	576
	×100	×100
	6,2500	**5,7600**

The population two years ago = 62,500

So, the present population = 57600.

141. The population of a town increases by 5% every year. If the present population is 9261, the population 3 years ago was.

Sol. $5\% = \frac{1}{20}$

	Before	After
I year	20	21
II year	20	21
III year	20	21
	8000	9261
	×1	×1
	8000	**9261**

Present population = 9261

So, the population three years ago was 8000.

142. The population of a village increases by 5% annually. If its present population is 4410, then its population 2 years ago was...

Sol. $5\% = \frac{1}{20}$

	Before	After
I year	20	21
II year	20	21
	400	441
	×10	×10
	4000	4410

Present population = 4410

So, Two years ago the population was 4,000.

143. The population of a village decreases at the rate of 20% per annum. If its population 2 years ago was 10,000 the present population is...

Sol. $-20\% = \frac{1}{5}$

I year →	5	4
II year →	5	4
	25	16
	×400	×400
2 yrs ago	10,000	**64,00**

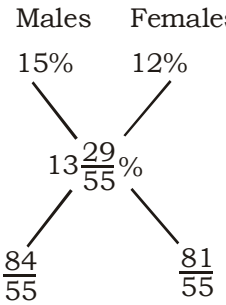
So, The present population is 64,00.

144. The population of a village is 5500. If no. of males are increased by 15% and no. of females are increased by 12% then population becomes 6244. find the difference between no. of males and females of that village.

Sol. We can do it by Alligation

% age change in total population

$$= \frac{6244-5500}{5500}\times 100 = 13\frac{29}{55}\%$$



Ratio of Male and Femal

Males : Females

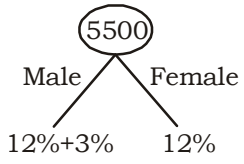
84 : 81

so difference between no. of males and females

$$= \frac{5500}{165}\times(84-81) = \frac{(5500)}{165}\times 3$$

= 100

Alternate:



$\frac{5500\times 12}{100}$ = 660

Increase population

= 6244 – 5500 = 744

Now, 744 – 660 = 84

3% males = 84

Males × $\frac{3}{100}$ = 84

Males = 2800

Females = 5500 – 2800 = 2700

Difference = 2800 – 2700 = 100

145. The population of a town is 3,11,250. The ratio of women to men is 43 : 40. If there are 24% literate among women and 10% illiterate, among men, the total number of literate persons in the town is.

Sol. Population of town = 3,11,250

No. of women in town

$= \frac{3,11,250}{(43+40)} \times 43 = 1,61,250$

No. of literate women

$= 1,61,250 \times \frac{24}{100} = 38700$

No. of literate men in the town

$= 1,50,000 \times \frac{(100-10)}{100}$

$= 1,50,000 \times \frac{90}{100} = 135000$

Total literate persons in town = (38700+135000) = 1,73,700

146. In a factory the production of cycles rose to 25,600 from 19,600 in 2 years. The rate of growth per annum is

Sol. Present production = 19,600

After two years = 25,600

Time = 2 years

Rate = ?

According to the question,

Production after 2 years

$\Rightarrow$ Present production $\left(1+\frac{R}{100}\right)^t$

$25,600 = 19,600\left(1+\frac{R}{100}\right)^2$

$\frac{256}{196} = \left(1+\frac{R}{100}\right)^2$

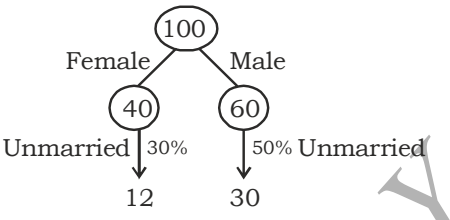
$1+\frac{R}{100} = \frac{16}{14}$

$\frac{R}{100} = \frac{1}{7}$

$R = \frac{100}{7} = 14\frac{2}{7}\%$

147. In a village, 40% of the population is female. 70% of the female and 50% of male are married. The Percentage of the unmarried population in the village is.

Sol. Let total population = 100



42 is unmarried out of 100

Required % = $\frac{42}{100} \times 100 = 42\%$

148. In the expression xy^2, the values of both variables x and y are decreased by 20%. By this, the value of expression is decreased by.

Sol. 20% = $\frac{1}{5}$, $xy^2 = x \times y \times y$

	Initial Value	Final Value
$x \rightarrow$	5	4
$y \rightarrow$	5	4
$y \rightarrow$	5	4
	125	64

–61

Required % = $\frac{61}{125} \times 100$

$= \frac{244}{5} = 48.8\%$

RY - XV

149. In an election between two candidates, Pankaj gets 65% of the total valid votes. If the total votes were 6000, what is the number of valid votes that the other candidate Nishant gets. if 25% of the total votes were decleared invalid?

Sol. Let the total number of valid votes get by Nishant = x

According to the question,

$x = 6000 \times \frac{75}{100} \times \frac{35}{100}$

$x = 1575$

150. In an election there are three candidates. The winning candidate got 55% votes and the candidate at the third place got 5% of the votes. If the winning candidate win by 9000 votes then find total number of votes while no vote was invalid.

Sol. The candidate at second place get = 100–(55+5)% = 40% votes

Difference between wining and second candidate = 55–40= 15%

According to the question,

15% = 9000

1% = 600

Total votes = 100 × 600

= 60,000

151. In a election between two candidates. The winning candidate got 80% of the total valid votes. If out of total 1,80,000 votes, 10% were declared invalid. Find the total number of valid votes got by the second candidate.

Sol. Total votes = 1,80,000

Invalid votes = 10%

valid votes = $\frac{1,80,000 \times 90}{100}$

Second candidates

$= 1,80,000 \times \frac{90}{100} \times \frac{20}{100}$

= 32,400

152. In an election between two candidates. 10% of the voters did not cast their votes while 10% of the vote polled were declared invalid. If the winning candidate of got 54% of the valid votes and won by 1620 votes then find the total number of voters in the voter list.

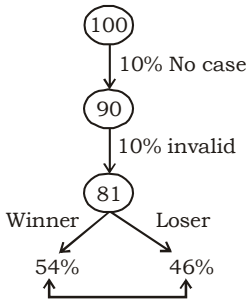
Sol. Let total valid votes = 100%
Then, 54% – 46% = 1620
8% = 1620

$$100\% = 1620 \times \frac{100}{8} = 20{,}250$$

According to the question,
Now the total no. of voters

$$= \frac{10}{9} \times \frac{10}{9} \times 20{,}250 = 25{,}000$$

Alternate:
Let the total valid votes = 100 units



8% → 1620
1% → 202.5
100% → 20250
81 unit → 20250 votes

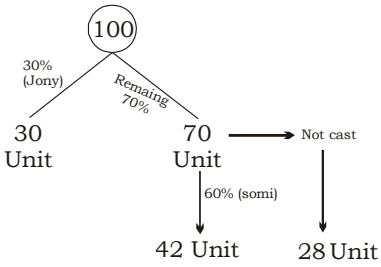
$$1 \text{ unit} = \frac{20250}{81}$$

$$\text{Total votes} = \frac{20250}{81} \times 100$$

= 25,000 votes

153. In an election 30% of the voters voted to Jony and 60% of the remaining voted to Somi and the remaining did not cast their vote. If the difference after number of voters voted to Jony and those who do not voted at all is 1200. If no vote was declared invalid. Find the number of voters who have the right to vote in this election.

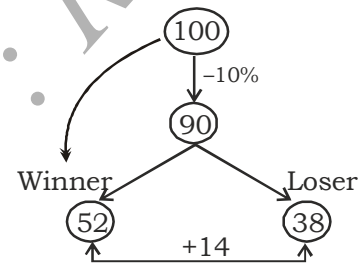
Sol. Let total no. of voters
= 100unit.



Difference of the no. of voters who vote for A and who did not cast their vote = $30x – 28x = 2x$
According to the question,
2x = 1200, x = 600
Hence total no. of voters
= 100 × 600 = 60,000

154. In an election two candidates participate 10% of the voters did not vote and out of total votes polled 2000 votes declared invalid. The winner gets 52% of the total votes on voting list and wins by 13200 votes. Find the no. of votes polled in favour of losing candidate?

Sol. Let the total no. of votes = 100 units
According to the question,



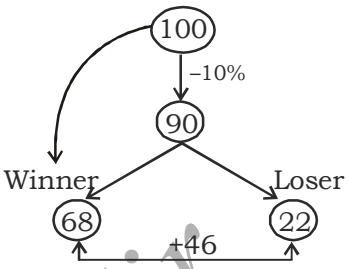
14 units =13200–2000 = 11200

$$1 \text{ unit} = \frac{11{,}200}{14} = 800$$

Votes polled for losing candidates = 800 × 38 – 2000
= 30400 – 2000 = 28400 votes

155. In an election 10% voters did not participated in an election and 1200 votes are found Invalid. The winner get 68% of total voting list and he won by 56400 votes. Find the votes polled in favour of losing candidate ?

Sol. Let the total votes = 100
According to the question,



46 units = 56400 – 1200
= 55200 (invalid votes)

$$1 \text{ unit} = \frac{55200}{46}$$

$$22 \text{ units} = \frac{55200}{46} \times 22$$

Votes for losing candidates

$$\frac{55200}{46} \times 22 - 1200 = 25200$$

156. 8% of voters in an election did not cast their votes. In this election there was only two candidates. The winner by obtaining 48% of the total votes defeated his contestant by 1100 votes. The total number of voters in the election was.

Sol. Let the total number of votes be 100
No. of uncast votes = 8
No. of votes polled = 92
No. of votes obtained by the loser = 92 – 48 = 44
In the difference of win be 4 votes, total voters = 100
When the difference be 1100

votes, total voters $\frac{100}{4} \times 1100$

= 27500
So, total no. of votes = 27,500

157. In an Loksabha election a candidates got 55% of the total valid votes. 2% of the total votes were declared invalid. If the total no. of voters is 104000 then the number of valid votes polled in favour of the candidate is.

Sol. Number of valid votes

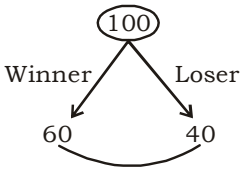
$= 104000 \times \frac{98}{100} = 101920$

$\therefore$ Valid votes received by the candidate $= \frac{101920}{100} \times 55$

$= 56056$

158. In an office, there was only two candidates one of the candidates secured 40% of votes and as defeated by the other candidates by 298 votes. Find the total number of votes.

Sol. Let total votes = 100



20 unit $\rightarrow$ 298

1 unit $\rightarrow \frac{298}{20}$

Total votes = 100 unit = $\frac{298}{20}$ × 100 = 1490

159. In an assembly election between two candidates 75% of the voters cast their votes, out of which 2% votes were declared invalid. A candidates got 9261 votes which were 75% of the valid votes. The total number of votes enrolled in that election was.

Sol. Let the total number of voters enrolled be = x

No. of votes polled = 75% of x

$= \frac{3x}{4}$

No. of valid votes

$= \frac{3x}{4} - \frac{2}{100} \times \frac{3x}{4}$

$= \frac{3x}{4} - \frac{3x}{200} = \frac{147x}{200}$

Now, 75% of $\frac{147x}{200} = 9261$

or $\frac{3}{4} \times \frac{147x}{200} = 9261$

$x = \frac{9261 \times 4 \times 200}{3 \times 147} = 16{,}800$

160. In a class 40% of the students are girls 40% of the girls and 60% of the boys voted for me. The percentage of votes I got was.

Sol. Let total students = 100

Required % = $\frac{40 \times 40}{100} + \frac{60 \times 60}{100}$

= 16 + 36 = 52%

161. In an election between two candidates one getting 60% of the votes polled, is elected by a majority of 14,000 votes. The number of votes polled for the winning candidate is.

Sol. Difference of % of votes = 60%–40% = 20%

20% of total votes = 14000

60% of total votes

$= \frac{14000}{20} \times 60 = 42{,}000$

162. In an election a candidate secured 62% of the votes and is elected by a margin of 1440 votes. The total number of votes polled is

Sol. Let the total no. of votes polled be = x

According to the question,

$\frac{x \times 62}{100} - \frac{x \times (100-62)}{100} = 1440$

$\frac{62x}{100} - \frac{38x}{100} = 1440$

$\frac{24x}{100} = 1440$

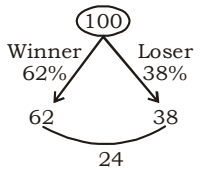
$24x = 1440 \times 100$

$x = \frac{1440 \times 100}{24}$

No. of votes polled(x) = 6000

Alternate:-

Let the total votes = 100



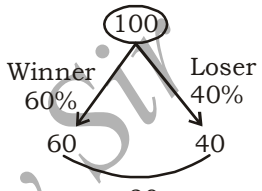
24 units $\rightarrow$ 1440

1 unit $\rightarrow$ 60

Total votes = 60 × 100 = 6000

163. Two candidates contested in an election in college one got 60% of the votes and won by 16000 votes. Find the number of votes polled ?

Sol. If the no. of votes polled be 100



20 units = 16000

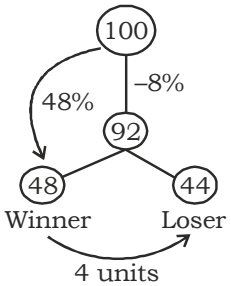
1 unit = 800

Total votes = 800 × 100

= 80,000

164. 8% of the voters in an election did not cast their votes. In this election, there were only two candidates. The winner by obtaining 48% of the total votes defeated his contestant by 1600 votes. The total no. of voters in the election was.

Sol. Let the total no. of voters = 100 units



Votes get by loser = 92–48

= 44 units

According to the question,

(48 – 44) units = 1600

4 units = 1600

1 unit = 400

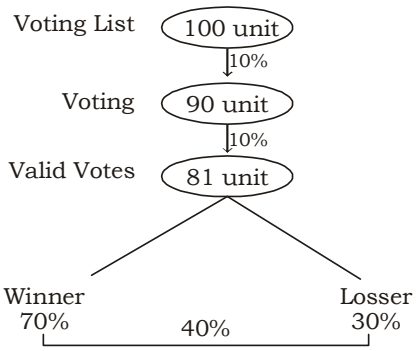
Total votes = 100 units

= 100 × 400

= **40000**

165. In an election two candidate participated 10% voters did not vote, out of which 10% votes declare invalid and the winner get 70% of valid votes, and he win by 7290 votes, then find the voting list.

Sol.



$$81 \times \frac{40}{100} \text{ Unit} = 7290$$

$$1 \text{ unit} = \frac{7290 \times 100}{81 \times 40}$$

$$= 225 \text{ votes}$$

Voting List = 100 unit × 225

= 22,500

Alternative:-

Let the voter list = x

$$x \times \frac{9}{10} \times \frac{9}{10} \times \frac{40}{100} = 7290$$

x = 22,500

166. In an election two candidate participated, 20% voters did not cast their votes, out of which 600 votes declared invalid and the winner get 75% of valid votes and he wins by 1500 votes find the no. of voters in voting list.

Sol. Let the voter List = x

$$\text{voting} = x \times \frac{4}{5}$$

$$\text{Valid votes} = \left(\frac{4}{5}x - 600\right)$$

winner gets vote = 75%

Losser gets votes = 25%

Winning = 75 – 25 = 50%

Now,

$$\left(\frac{4}{5}x - 600\right) \times \frac{50}{100} = 1500$$

x = 4500

167. In an election two candidate participated, 10% voter did not vote, 2500 votes declared invalid and the winner get 55% of valid votes and he win by 2000 votes. find the number of voters in voting list.

Sol: Let the voting list = x

$$\text{voting} = x \times \frac{90}{100} = \frac{9x}{10}$$

$$\text{valid votess} = \left(\frac{9x}{10} - 2500\right)$$

Winner gets = 55

Losser gets = 45%

Wins = 55 – 45 = 10%

Now,

$$\left(\frac{9x}{10} - 2500\right)\frac{10}{100} = 2000$$

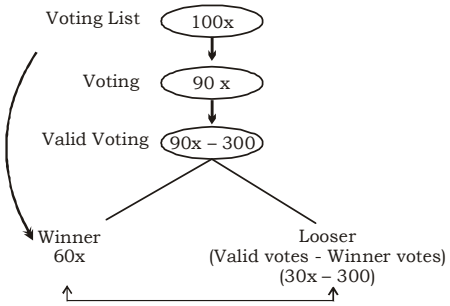
$$\frac{9x}{100} - 250 = 2000$$

$$\frac{9x}{100} = 2250$$

x = 25, 000

168. In an election two candidate participated 10% voters did not vote, 300 votes declared invalid and the winner get 60% votes of voting list and he win by 900 votes. Find the no. of valid votes.

Sol : Let the voting list



Winner wins

= 60x – (30x – 300) = 900

30x + 300 = 900

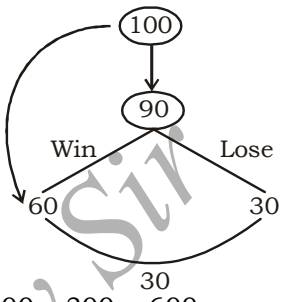
30x = 600

x = 20

Valid votes = 90x – 300 = 90 × 20 – 300 = 1500

Alternate:

Let the total voting list = 100 units



900 – 300 = 600

30 units = 600

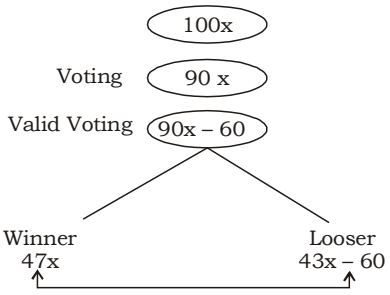
1 unit = 20

voting = 90 × 20 = 1800

valid votes = 1800 – 300 = 1500

169. In an election two candidate participated, 10% voters did not vote and 60 votes declare invalid and winner get 47% of voting list and he win by 308 votes.Find the no. of voting list.

Sol. Let the voting list



Winner win =

47x – (43x – 60) = 308

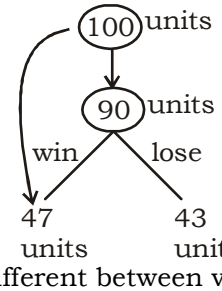
4x = 308 – 60

x = 62

Voting List = 100x

= 100 × 62 = 6200

Alternate:



Different between votes

= winning votes – invalid votes

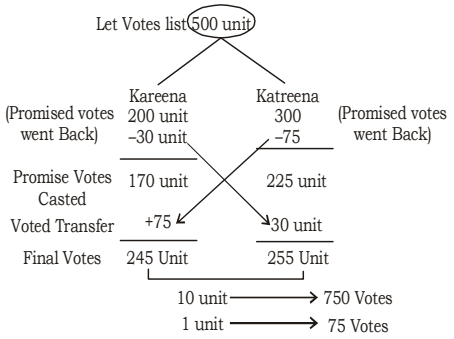
4 units = 308 – 60 = 248

1 unit = 62

Total votes = 62 × 100 = 6200

170. In an election Kareena and Katreena participated 2/5 of the voters promised to vote for Kareena and rest promise to vote for Katreena. On the voting day 15% of the voters went back on their promise to vote for Kareena and 25% of the voters went back on their promise to vote for Katreena. Find the total no. of voters if Katreena wins by 750 votes.

Sol: In such type of question let the value of Base of fraction with 100



So, Voter List = 500 unit × 75
= 37,500 Votes

171. In an election, 3 candidate participated, the loosing candidate got 30% votes. What would be the minimum absolute margin votes by which the winning candidate led by the nearest rival if each candidate got an integral percent of votes.

Sol: If we need the minimum margin between 2 candidates then we need to give 30% votes to IIIrd position candidate.

Remaining 70% votes is divided between Ist and II nd candidate, with minimum integral difference.

I II III

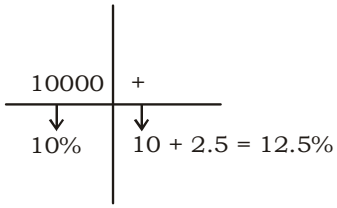
36% 34% 30%

So, minimum % integral difference is 2% (36% – 34%) but he ask minimum integral of votes (note % of votes) So, difference is 1 votes [when total votes are 50]

RY - XVI

172. A Salesman gets 10% commission on the total sales and on extra bonus of 2.5% on the sale above Rs. 10,000. If he earns 2,875 rupees. Find the total sales.

Sol. Let the total sell be 'x' rupees.



$\frac{10000 \times 2.5}{100} = 250$

2875 + 250 = 3125

Total sale × $\frac{12.5}{100}$ = 3125

Total sale × $\frac{125}{100 \times 10}$ = 3125

Total sale = 3125 × 8 = 25000

173. Rakesh yadav gets a commission of 5% upto the sell of Rs. 10,000 and above this he gets 4% commission on the sale. If after deducting his commission he deposits Rs. 31100 to the company, Find his total sale.

Sol. Rakesh yadav got the 5% commission upto 10,000 and 4% above it.

Now let total sale be 'x' rupees.

Then,

95% of (10,000) + 96% of (x – 10,000) = 31000

adding 1% of 10,000 on both sides i.e. 100

$\Rightarrow$ 100 + 95% of (10,000) + 96% of (x – 10,000) = 31,100 + 100

$\Rightarrow$ 95% of (10,000) + 96% of (x–10,000) = 31,200

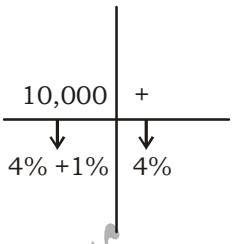
$\Rightarrow$ 96% of x = 31,200

$x = \frac{31200}{96} \times 100$

= Rs. 32,500

Alternate:

Let the total sale = x



$10000 \times \frac{1}{100} = 100$

31100 + 100 = 31200

96% of x = 31200

$x \times \frac{96}{100} = 31200$

x = 32,500

174. A salesman is hired on the condition a job saying that he will be given 6% commission on the sales done by him. But later on it was decided that he will be given a monthly salary of Rs. 1200 and every month, 3% commission will be awarded on sales above Rs. 5000. If in second case his earnings are Rs. 1350 less than earlier, then find his sales per month.

Sol. Let sales done by him is 100 x

Case I : Earnings are = 6x

Case II : Earnings are

$\Rightarrow 1200 + (100x - 5000) \times \frac{3}{100}$

= 1200 + (3x – 150)

According to question,

$\Rightarrow$ 6x – (1200 + 3x – 150) = 1350

$\Rightarrow$ 3x – 1200 + 150 = 1350

$\Rightarrow$ 3x – 1050 = 1350

$\Rightarrow$ 3x = 2400

$\Rightarrow$ x = 800

Total sales = 100 × 800

= Rs. 80,000

175. A Salesman is allowed 12% commission on the total sales made by him and a bonus of 1% on the sales over Rs. 15,000. If the total earning of a salesman is Rs. 7650.

Find the total sales.

Sol. Let the total sales = x

$$x \times \frac{12}{100} + \text{₹}x - 15000 \times \frac{1}{100} = 7650$$

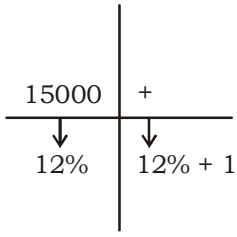
$$\frac{12x}{100} + \frac{x}{100} - 150 = 7650$$

$$\frac{13x}{100} = 7800$$

$x = 60000$

Alternate:

Let the total sales



$$1\% \text{ of } 15000 = \frac{15000 \times 1}{100} = 150$$

Let 13% commission on total sale

Then, total earning

= 7650 + 150 = 7800

13% of total sale = 7800

$$\text{Total sale} \times \frac{13}{100} = 7800$$

Total sale = 60,000

176. A salesman is allowed 9% commission on the total sales made by him and a bonus of 1% on the sales over Rs. 20,000. If the total earning of a salesman is Rs. 6800.

Sol. Let the total sales = x

Earning

$$x \times \frac{9}{100} + (x - 20,000) \times \frac{1}{100} = 6800$$

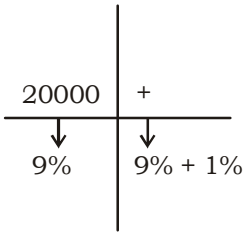
$$\frac{9x}{100} + \frac{x}{100} - 200 = 6800$$

$$\frac{10x}{100} = 7000$$

x = 70000

Alternate:

Let the total sales = x



Let 10% commission on total sales

Then, earning

$$= 20000 \ \frac{1}{100} + 6800 = 7000$$

10% of x = 7000

$$x \times \frac{1}{10} = 7000$$

x = 70,000

177. A Salesman is allowed $5\frac{1}{2}\%$ commission on the total sales made by him and a bonus of 1/2% on the sales over Rs. 10,000.

If his total earning is Rs. 1990

Find total sales.

Sol. Let the total sales = x

$$\text{Earning} \quad x \times 5\frac{1}{2}\% + (x - 10000)$$

$$\times \ \frac{1}{2}\% = 1990$$

$$\frac{x \times 11}{2 \times 100} + (x - 10000) \times \frac{1}{2 \times 100}$$

= 1990

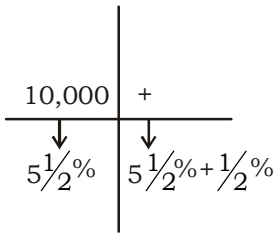
$$\frac{11x}{200} + \frac{x}{200} - 50 = 1990$$

$$\frac{12x}{200} = 2040$$

$x = 170 \times 200$

x = 34,000

Alternate:



Let 6% commission on total sales

Then earning

$$10000 \times \frac{1}{2 \times 100} + 1990 = 2040$$

6% of total sales = 2040

$$\frac{6}{100} \times \text{Total sales} = 2040$$

Total sales = 34000

178. A company give 12% commission to his salesman on total sales and 1% bonus on the sales over RS. `15000, If the salesman deposite Rs. 52,350 after deducting his earning from total sales. Find total sales.

Sol: Let the total sales = x

$$\text{Earning} \Rightarrow x \times \frac{12}{100} +$$

$$(x - 15000) \times \frac{1}{100}$$

$$\frac{12x}{100} + \frac{x}{100} - 150$$

$$\frac{13x}{100} - 150$$

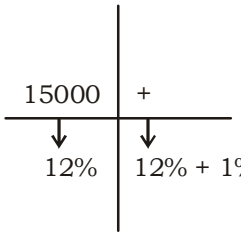
ATQ Total sales – earning = 52,350

$$x - \left(\frac{13x}{100} - 150\right) = 52,350$$

$$x - \frac{13}{100}x + 150 = 52350$$

$$\frac{87x}{100} = 52,200 \quad x = \text{Rs. } 60,000$$

Alternate:



Let 13% commission of total sales

Then, earning = $15000 \times \frac{1}{100}$

= 150

deposite Rs. after deducting earning

= 52,350 – 150 = 52,200

87% of x = 52,200

$x \times \frac{87}{100} = 52{,}200$

Total sales = x = 60,000

RY - XVII

179. 1 litre of water is added to 5 litres of alcohol water solution containing 40% alcohol strength. The strength of alcohol in the new solution will be...

Sol. Alcohol in original solution

$= \frac{40}{100} \times 5 = 2$ litres

Water in original solution

$= \frac{60}{100} \times 5 = 3$ litres

On adding 1 litre water, water becomes 4 litres.

Now, 6 litres of solution contains 2 litres of alcohol.

$\therefore$ 100 litres of solution contains $= \frac{2}{6} \times 100 = \frac{100}{3}$

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

180. If 4 litres of water is evaporated on boiling from 12 litres of salt solution containing 7% salt, the percentage of salt in remaining solution is...

Sol. In 12 litres salt solution,

Salt = $\frac{7 \times 12}{100} = 0.84$ units

Water = 12 – 0.84

=11.16 units

After evapouration, percentage of salt = $\frac{0.84}{8} \times 100$

= 10.5%

181. A vessel has 60 litres of solution of acid and water having 80% acid. How much water be added to make it a solution in which acid forms 60%.

Sol. In 60 litres solution, water

$= \frac{60 \times 20}{100} = 12$ litres

On adding x litres of water

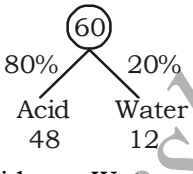
$= \frac{12 + x}{60 + x} \times 100 = 40$

$\Rightarrow 60 + 5x = 120 + 2x$

$\Rightarrow 3x = 60$

$\Rightarrow x = 20$ litres

Alternate:



Acid		Water
80	:	20
60	:	40

Acid : Water

$4_{\times 3}$: $1_{\times 3}$

$3_{\times 4}$: $2_{\times 4}$

Acid is constant

Acid	Water	
12	3 → 15 →	Initial
12	8 → 2 →	affter adding water

(3 → 15 and 8 → 2 : 5 units)

15 unit → 60

1 unit → 4

5 units = 5 × 4 = 20L

182. A litre of pure alcohol is added to 6 litres of 30% alcohol solution. The percentage of water in the solution is...

Sol. In 30% alcohol solution,

Alcohol = $\frac{30}{100} \times 6 = 1.8$ litres

Water = 4.2 litres

On mixing 1 litre of pure alcohol, percentage of water

$= \frac{4.2}{7} \times 100 = 60\%$

183. How much water must be added to 100 ml of 80 percent solution of boric acid to reduce it to a 50% solution.

Sol. Let x ml of water be added

$\frac{20 + x}{100 + x} \times 100 = 50$

$\Rightarrow 40 + 2x = 100 + x$

$\Rightarrow x = 60$ ml.

Alternate:

Boric acid		Water
80	:	20
50	:	50

Boric acid : Water

4 : 1

$1_{\times 4}$: $1_{\times 4}$

Boric acid is constant

Then, equal the value of boric acid

B.A : Water

4 : 1 → 5

4 : 4 → 8 (3 units)

5 units → 100 ml

1 unit → 20 ml

3 units → 3 × 20 = 60 ml

184. In one litre of a mixture of alcohal and water, water is 30%. The amount of alcohal that must be added to mixture so that the part of water in the mixture becomes 15% is.

Sol. In 1 litre i.e. 1000 ml of mixture.

Alcohal = 700 ml,

Water = 300 ml

Let x ml of alcohal is mixed.

$\therefore \frac{300}{1000 + x} \times 100 = 15$

$\Rightarrow 1000 + x = 2000$

$\Rightarrow x = 1000$ ml

Alternate:

Alcohal		Water
70	:	30
85	:	15

Alcohal		Water	
7	:	3 → 10	10
17	:	3 → 20	

10 units → 1 litre = 1000 ml

1 unit → 100 ml

10 unit = 10 × 100

= 1000ml

185. 40 litre of a mixture of milk and water contains 10% of water, the water to be added, to make the water content 20% in the new mixture is.

Sol. Milk : Water
90 : 10
80 : 20
Milk : Water
$9_{\times 4}$: $1_{\times 4}$
$4_{\times 9}$: $1_{\times 9}$
Milk is constant

Milk	:	Water	
36	:	4 ⟶ 40	) 5
36	:	9 ⟶ 45	

40 units = 40
1 unit = 1 litre
5 unit = 5 × 1 = 5 litres.

186. How much pure alcohol has to be added to 400 ml of a solution containg 15% of alochol to change the concentration of alcohol in the mixture to 32%?

Sol. Alcohol = $\left(\frac{15}{100}\times 400\right)$ml = 60 ml
Water = 340 ml
Let x ml of alcohol be added,
Then, $\frac{60+x}{400+x}\times 100 = 32$

$\Rightarrow \frac{60+x}{400+x} = \frac{8}{25}$
$\Rightarrow$ 1500 + 25x = 3200 + 8x
$\Rightarrow$ 17x = 1700
$\Rightarrow$ x = 100 ml

Alternate:
Alcohal : Water
15 : 85
32 : 68
Alcohal : Water

3	:	17 ⟶ 20	)	5
8	:	17 ⟶ 25		

Water is constant
20 units → 400
1 unit → 20 litre
5 units → 5 × 20 = 100 litre

187. In 50 gm alloy of gold and silver, the gold is 80% by weight. How much gold should be mixed to this alloy so that the weight of gold would become 95%?

Sol. Initial quantity of gold

$= \frac{50\times 80}{100}$ = 40 gm

Let x gm be mixed,

$40 + x = (50 + x)\times\frac{95}{100}$

$\Rightarrow 40 + x = (50 + x)\times\frac{19}{20}$

$\Rightarrow$ 800 + 20x = 950 + 19x
$\Rightarrow$ x = 150 gm

Alterante:

Gold : Silver
80 : 20
95 : 5
Gold : Silver

4	:	1 ⟶ 5	)	15
19	:	1 ⟶ 20		

Silver is constant
5 units → 50
1 unit → 10 gm
15 units = 15 × 10 = 150 gm

188. 300 gm of sugar solution has 40% of sugar in it. How much sugar should be added to make it 50% in the solution?

Sol. In 300 gm of solution,

Sugar = $300\times\frac{40}{100}$ = 120 gm

Let x gm of sugar be mixed.
According to question,

$\frac{120+x}{300+x} = \frac{1}{2}$

$\Rightarrow$ 240 + 2x = 300 + x
$\Rightarrow$ x = 60 gm

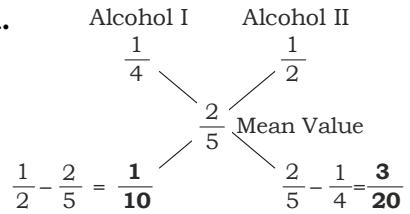
Alternate:
Sugar : Other
40 : 60
50 : 50
Sugar : Other
$2_{\times 1}$: $3_{\times 1}$
$1_{\times 3}$: $1_{\times 3}$
Other solution is constant

Sugar	:	Other		
2	:	3 ⟶ 5	)	1
3	:	3 ⟶ 6		

5 units → 300
1 unit = 60 gm

189. In what ratio must 25% of alcohol be mixed with 50% of alcohol to get a mixture of 40% strength alcohol ?

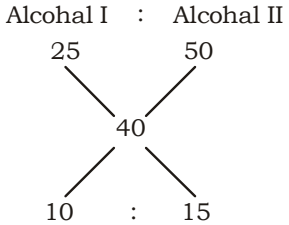
Sol.



$\therefore$ The required ratio

$= \frac{1}{10} : \frac{3}{20}$ = 2 : 3

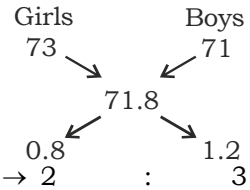
Alternate:



Required ratio = 2 : 3

190. In a class the average score of girls in an exam is 73 and that of boys is 71. The average score for the whole class is 71.8. Find the % of girls.

Sol. By alligation rule,

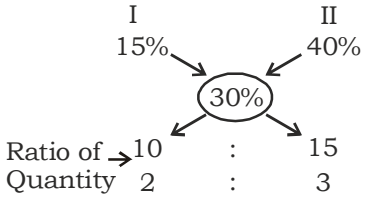


Ratio → 2 : 3
Required % of girls

$= \frac{2}{3+2}\times 100$ = 40%

191. The ratio in which two sugar solutions of the concentrates 15% and 40% are to be mixed to get a solution of concentration 30% is.

Sol. By using Allegation Rule,



192. The population of a village was 9800. In a year with the increase in population of males by 8% and that of Females by 5% the population of the village became 10458. What was the number of males in the village before increase.

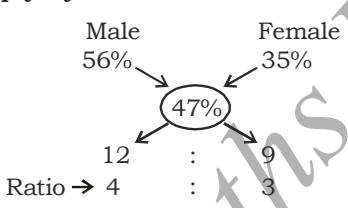
Sol. Increase in Population
= 10458–9800 = 658

$$\% \text{ increment} = \frac{658}{9800} \times 100$$

$$= \frac{47}{7}\%$$

Using allegation method,

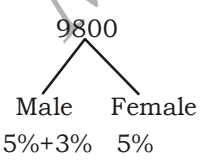
Note: to make calculation easier multiply by 7 to all data



Required population of males

$$= \frac{9800}{4+3} \times 4 = 5600$$

Alternate:-



$$= \frac{9800 \times 5}{100} = 490$$

Increase in population
= 10450 – 9800 = 658

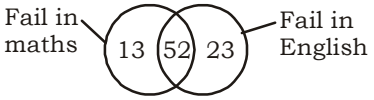
Now,
658 – 490 = 168
3% of male = 168

$$\text{No. of male} = \frac{168}{3} \times 100 = 5600$$

RY - XVIII

193. In an examination 65% students failed in maths and 75% students failed in english while 52% students failed in both the subjects. If 48 students passed in both the subjects then find the total no. of students appeared in the examination

Sol.

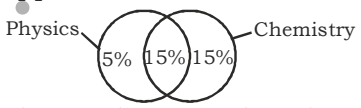


total % of failed students
= 13+52+23 = 88
Hence % of passed students
= (100–88)% = 12%
According to the question
=12% of the total students=48
total no. of students

$$= 48 \times \frac{100}{12} = 400$$

194. In an examination 80% students passed in physics, 70% in chemistry while 15% failed in both the subjects. if 325 students passed in both the subjects. Find the total numbers of students who appeared in the examination.

Sol.



(Failed venn diagram of students)
total failed students
= 5 +15+15 = 35%
total passed students
= (100 –35)
= 65%
According to the question
= 65% = 325

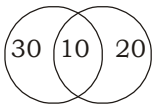
$$1\% = \frac{325}{65}$$

Total students (100%)

$$= \frac{325}{65} \times 100 = 500$$

195. In an examination 40% of the students failed in maths, 30% failed in English and 10% failed in both. Find the percentage of students who passed in both the subjects.

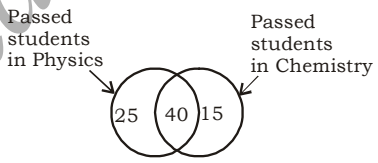
Sol.



The percentage of students who fail in one or two or both subjects = 40 + 30 – 10 = 60%
So, percentage of passed students = 100 – 60 = 40%

196. 600 students took the test on physics and chemistry 35% students failed in physics and 45% students failed in chemistry and 40% of those who passed in chemistry also passed in physics. Then how many students failed in both.

Sol.

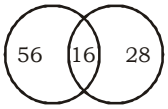


Students passed in Physics
= (100–35) = 65%
Student passed in Chemistry
= (100–45) = 55%
Student passed in either one or both subjects
= (65+55–40) = 80%
Hence students failed in both subjects = 20%

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

197. In a group every person takes either tea or coffee or both. If 72% persons take tea and 44% persons take coffee. If there are 192 persons take tea and coffee, then find total no. of persons in the group

Sol.



Persons taking either tea or coffee = 72 + 44=116%
Total persons = 100%
Hence 16% of persons take both tea and coffee.

$$16\% \longrightarrow 192 \text{ (given)}$$

$$100\% = \frac{192}{16} \times 100 = 1200$$

$\therefore$ The total number of persons in the group are = 1200

Exercise

1. Student A scores 20 marks in an examination out of 30 while another student B scores 40 marks out of 70. Who has performed better ?
   (a) A (b) B
   (c) A = B
   (d) Can't be determined
2. Company A increases its sales by 1 crore rupees while company B increases its sales by 10 crore rupees. Which company has more percentage growth?
   (a) A (b) B
   (c) Both have same growth rate
   (d) Can't be determined
3. The population of a city grew from 20 lakh to 22 lakh. Find the percentage change based on the final value of population.
   (a) $9\frac{1}{11}\%$ (b) 8%
   (c) 9% (d) 10%
4. A sells his goods 30% cheaper than B and 30% dearer than C. By what percentage is the cost of C's goods cheaper than B's goods.
   (a) 46.15% (b) 47.15%
   (c) 67% (d) 67.15%
5. The length and the breadth of a rectangle are changed by + 20% and by –10% respectively. What is the percentage change in the area of the rectangle.
   (a) 8% increase
   (b) 8% decrease
   (c) 10% increase
   (d) None of these
6. Due to a 25% price high in the price of rice, a person is able to purchase 20 kg less of rice for Rs. 400. Find the initial price.
   (a) 4 Rs/kg (b) 5 Rs/kg
   (c) 8 Rs/kg (d) None of these
7. A's salary is 20% lower than B's salary, which is 15% lower than C's salary. By how much percent is C's salary more than A's salary?
   (a) $47\frac{1}{7}\%$ (b) $48\frac{1}{7}\%$
   (c) $47\frac{2}{7}\%$ (d) None of these
8. The cost of manufacture of an article is made up of four components A, B, C and D which have a ratio of 3 : 4 : 5 : 6 respectively. If there are respective changes in the cost of +10%, –20%, –30%, and +40%, then what would be the percentage change in the cost.
   (a) $2\frac{2}{9}\%$ (b) $3\frac{2}{9}\%$
   (c) 4% (d) $1\frac{2}{9}\%$
9. Rakesh Yadav receives an inheritance of a certain amount from his grandfather. Of this he loses 32.5% in his effort to produce a film. From the balance, a taxi driver stole the sum of Rs. 1,00,000 that he used to keep in his pocket. Of the rest, he donated 20% to a charity. Further he purchases a flat in Ganga Apartment for Rs. 7.5 lakh. He then realises that he is left with only Rs. 2.5 lakh cash of his inheritance. What was the value of his inheritance ?
   (a) 25 lakh (b) 22.5 lakh
   (c) 20 lakh (d) 18 lakh
10. What is 20% of 50% of 75% of 70?
    (a) 5.25 (b) 6.75
    (c) 7.25 (d) 5.5
11. If we express $41\frac{3}{17}\%$ as a fraction, then it is equal to
    (a) $\frac{17}{7}$ (b) $\frac{7}{17}$
    (c) $\frac{12}{17}$ (d) $\frac{3}{17}$
12. Mr. Rakesh Yadav is worried about the balance of his monthly budget. The price of petrol has increased by 40%. By what percent should he reduce the consumption of petrol so that he is able to balance his budget?
    (a) 33.33 (b) 28.56
    (c) 25 (d) 14.28
13. In Question 12, if Rakesh Yadav wanted to limit the increase in his expenditure to 5% on his basic expenditure on petrol, then what should be the corresponding decrease in consumption.
    (a) 33.33 (b) 28.56
    (c) 25 (d) 20
14. Ram sells his goods 25% cheaper than Shyam and 25% dearer than Balram. How much percentage is Balram's goods cheaper than Shyam's ?
    (a) 33.33% (b) 50%
    (c) 66.66% (d) 40%
15. In an election between 2 candidates, Rakesh Yadav gets 65% of the total valid votes. If the total votes were 6000, what is the number of valid votes that the other candidate Bhuvnesh gets, if 25% of the total votes were declared invalid ?
    (a) 1625 (b) 1575
    (c) 1675 (d) 1525
16. In a medical certificate, by mistake a candidate gave his height as 25% more than normal. In the interview pannel, he clarified that his height was 5 feet 5 inches. Find the percentage correction made by the candidate from his stated height to his actual height.
    (a) 20% (b) 28.56%
    (c) 25% (d) 16.66%
17. Arjit Sharma generally wears his father's coat. Unfortunately, his cousin Shaurya poked him one day that he was wearing a coat of length more than his height by 15%. If the

length of Arjit's father's coat is 120 cm then what should be the actual length of the his coat.

(a) 105 (b) 108

(c) 104.34 (d) 102.72

18. A number is mistakenly divided by 5 instead of being multiplied by 5. Find the percentage change in the result due to this mistake.

(a) 96% (b) 95%

(c) 2400% (d) 200%

19. The price of an item is increased by 20 % and then decreased by 20 %. The final price as compared to original price is:

(a) 20 % less (b) 20 % more

(c) 4 % more (d) 4 % less

20. 50% of a% of b is equal to 75% of b% of c. Which of the following is c?

(a) 1.5a (b) 0.667a

(c) 0.5a (d) 1.25a

21. The length, breadth and height of a room in the shape of a cuboid are increased by 10%, 20% and 50% respectively. Find the percentage change in the volume of the cuboid.

(a) 77% (b) 75%

(c) 88% (d) 98%

22. The price of sugar is reduced by 25% but inspite of the decrease, Aayush ends up increasing his expenditure on sugar by 20%. What is the percentage change in his monthly consumption of sugar ?

(a) +60% (b) –10%

(c) +33.33% (d) 50%

23. When 60% of number A is added to another number B, B becomes 175% of its previous value. Then which of the following is true regarding the values of A and B ?

(a) A > B (b) B > A

(c) B ≥ A

(d) either (a) or (b) can true depending upon the values of A and B

24. In an election, the candidate who got 56% of the votes cast won by 144 votes. Find the total number of voters in the voting list if 80% people cast their vote and there were no invalid votes.

(a) 360 (b) 720

(c) 1800 (d) 1500

25. The population of a village is 1,00,000. The rate of increase is 10% per annum. Find the population at the start of the third year.

(a) 1,33,100 (b) 1,21,000

(c) 1,18,800 (d) 1,20,000

26. The population of the Mukherjee Nagar is 10,000 at this moment. It increases by 10% in the first year. However, in the second year, due to immigration, the population drops by 5%. Find the population at the end of the third year if in the third year the population increases by 20%.

(a) 12,340 (b) 12,540

(c) 1,27,540 (d) 12,340

27. Rakesh Yadav invests Rs. 10,000 in some shares in the ratio 2 : 3 : 5 which pay dividends of 10%, 25% and 20% (on his investment) for that year respectively. Find his dividend income.

(a) 1900 (b) 2000

(c) 2050 (d) 1950

28. In an examination, Rakesh Yadav obtained 20% more than Bhuvnesh but 10% less than Pawan. If the marks obtained by Bhuvnesh is 1080. find the percentage marks obtained by Pawan if the full marks is 2000.

(a) 86.66% (b) 72%

(c) 78.33% (d) 77.77%

29. In a class, 25% of the students were absent for an exam. 30% failed by 20 marks and 10% just passed because of grace marks of 5. Find the average score of the class if the remaining students scored an average of 60 marks and the pass marks are 33 (conunting the final scores of the candidates).

(a) 37.266 (b) 37.6

(c) 37.8 (d) 36.93

30. Rakesh Yadav spends 20% of his monthly income on his houshold expenditure, 15% of the rest on books, 30% of the rest on clothes and saves the rest. On counting, he comes to know that he has finally saved Rs. 9520. Find his monthly income.

(a) 10000 (b) 15000

(c) 20000 (d) 12000

31. Rakesh Yadav and Bhuvnesh have salaries that jointly amount to Rs. 10,000 per month. They spend the same amount monthly and then it is found that the ratio of their savings is 6 : 1. Which of the following can be Rakesh Yadav's salary ?

(a) Rs 6000 (b) Rs 5000

(c) Rs 4000 (d) Rs 3000

32. The population of a village is 5500. If the number of males increase by 11% and the number of females increases by 20% then the population becomes 6330. Find the population of females in the town.

(a) 2500 (b) 3000

(c) 2000 (d) 3500

33. Bhuvnesh's salary is 75% more than Saurabh's. Bhuvnesh got a raise of 40% on his salary while Saurabh got a raise of 25% on his salary. By what percent is Bhuvnesh's salary more than Saurabh's ?

(a) 96% (b) 51.1%

(c) 90% (d) 52.1%

34. Last year, the Indian cricket team played 40 one day cricket matches out of which they managed to win only 40%. This year, so far it has played some matches, which has made it mandatory for it to win 80% of the remaining matches to maintain its existing winning percentage. Find the number of mathes played by India so far this year.
(a) 30 (b) 25
(c) 28
(d) Insufficient Information

35. In the recent, climate conference in New York, out of 700 men, 500 women, 800 children present inside the building premises, 20% of the men, 40% of the women and 10% of the children were Indians. Find the percentage of people who were not Indian.
(a) 73% (b) 77%
(c) 79% (d) 83%

36. A cow and a calf cost Rs. 2000 and Rs. 1400 respectively. If the price of the cow and that of the calf is increased by 20% and 30% respectively then the price of 1 dozen cows and 2 dozen calves is:
(a) 72,480 (b) 71,360
(c) 74,340 (d) None of these

37. During winters, an athlete can run 'x' meters on one bottle of Glucose. But in the summer, he can only run $0.5x$ meters on one bottle of Glucose. How many bottles of Glucose are required to run 400 meters during summer ?
(a) $800/x$ (b) $890/x$
(c) 96 (d) $454/x$

38. Out of the total production of iron from hemetite, an ore of iron, 20% of the ore gets wasted, and out of the remaining ore, only 25% is pure iron. If the pure iron obtained in a year from a mine of hematite was 80,000 kg, then the quantity of hematite mined from that mine in the year is
(a) 5,00,000 kg
(b) 4,00,000 kg
(c) 4,50,000 kg
(d) None of these

39. A man buys a truck for Rs. 2,50,000. The annual repair cost comes to 2.0% of the price of purchase. Besides, he has to pay an annual tax of Rs. 2000. At what monthly rent must he rent out the truck to get a return of 15% on his net investment of the first year ?
(a) Rs 3350 (b) Rs 2500
(c) Rs 4000 (d) Rs 3212.50

40. Recently, while shopping in Mukherjee Nagar, Delhi, I came across two new shirts selling at a discount. I decided to buy one of them for my little boy Sherry. The shopkeeper offered me the first shirt for Rs. 42 and said that it usually sold for 8/7 of that price. He then offered me the other shirt for Rs. 36 and said that it usually sold for 7/6th of that price. Of the two shirts which one do you think is a better bargain and what is the percentage discount on it ?
(a) First shirt, 12.5%
(b) second shirt, 14.28%
(c) Both are same
(d) None of these

41. 4/5th of the voters in Delhi promised to vote for Rakesh Yadav and the rest promised to vote for Bhuvnesh. Of these voters, 10% of the voters who had promised to vote for Rakesh Yadav did not vote on the election day, while 20% of the voters who had promised to vote for Bhuvnesh did not vote on the election day. What is the total number of votes polled if Rakesh Yadav got 216 votes ?
(a) 200 (b) 300
(c) 264 (d) 100

42. In an examination, 80% students passed in Physics, 70% in Chemistry while 15% failed in both the subjects. If 325 students passed in both the subjects. Find the total number of students who apperared in the examination.
(a) 500 (b) 400
(c) 300 (d) 600

43. Rakesh Yadav spends 30% of his salary on house rent, 30% of the rest he spends on his children's education and 24% of the total salary he spends on clothes. After his expenditure, he is left with Rs. 2500. What is Rakesh Yadav's salary ?
(a) Rs 11,494.25
(b) Rs. 20,000
(c) Rs 10,000
(d) Rs.15,000

44. The entrance ticket at the Batra cinema in Delhi is worth Rs. 250. When the price of the ticket was lowered, the sale of tickets increased by 50% while the collection recorded a decrease of 17.5%. Find the deduction in the ticket price
(a) Rs 150 (b) Rs. 112.5
(c) Rs 105 (d) Rs. 120

45. Rakesh Yadav's monthly salary is A rupees. Of this , he spends X rupees. The next month he has an increase of C% in this salary and D% in his expenditure. The new amount saved is:

(a) A(1+C/100) – X (1+D/100)
(b) (A/100) (C – (D) X (1+D/100)
(c) X(C – (D)/100
(d) X(C + D)/100

46. In the year 2000, the luxury car industry had two car manufactures – Maruti and Honda with market shares of 25% and 75% respectively. In 2001, the overall market for the product increased by 50% and a new player BMW also entered the market and captured 15% of the market share. If we know that the market share of Maruti increased to 50% in the second year, the share of Honda in that year was:
(a) 50% (b) 45%
(c) 40% (d) 60%

47. Ambani, a very clever businessman, started off a business with very little capital, In the first year, he earned a profit of 50% and donated 50% of the total capital (initial capital + profit) to a charitable organisation. The same course was followed in the 2nd and 3rd years also. If at the end of three years, he is left with Rs. 16,875, then find the amount donated by him at the end of the 2nd year.
(a) Rs 45,000 (b) Rs 12,500
(c) Rs 22,500 (d) Rs 20,000

48. In an examination, 48% students failed in Hindi and 32% students in History, 20% students failed in both the subjects. If the number of students who passed the examination was 880, how many students appeared in the examination if the examination consisted only of these two subjects ?
(a) 2000 (b) 2200
(c) 2500 (d) 1800

49. At IIM Bangalore, 60% of the students are boys and the rest are girls. Further 15% of the boys and 7.5% of the girls are getting a fee waiver. if the number of those getting a fee waiver is 90, find the total number of students getting 50% concession if it is given that 50% of those not getting a fee waiver are eligible to get half fee concession?
(a) 360 (b) 280
(c) 320 (d) 330

50. A machine depreciates in value each year at the rate of 10% of its previous value. However, every second year there is some maintenance work so that in that particular year, depreciation is only 5% of its previous value. If at the end of the fourth year, the value of the machine stands at Rs. 1,46,205, then find the value of machine at the start of the first year.
(a) Rs 1,90,000
(b) Rs 2,00,000
(c) Rs 1,95,000
(d) Rs 2,10,000

51. Rakesh Yadav's project report consists of 25 pages each of 60 lines with 75 characters on each line. In case the number of lines is reduced to 55 but the number of characters is increased to 90 per lines. What is the percentage change in the number of pages. (Assume the number of pages to be a whole number)
(a) + 10% (b) +5%
(c) – 8% (d) – 10%

52. The price of soap is collectively decided by five factors : research, raw materials, labour, advertisements transportation. Assume that the functional relationship is :
Price of soap = (k × Research costs × Raw material costs × Labour costs × Advertising cost × Transportion cost)
If there are respective changes of 10% , 20% , –20%, 25% and 50% in the five factors, then find the change in the price of soap.
(a) 97% (b) 95%
(c) 98% (d) 96%

53. After receiving two successive raises, Rakesh Yadav's salary became equal to 15/8 times of his initial salary. By how much percent was the salary raised the first time if the second raise was twice as high (in percent) as the first ?
(a) 15% (b) 20%
(c) 25% (d) 30%

54. The ratio of Bhuvnesh' salary for October to his salary for November was 1.5 : 1.333 and the ratio of the salary for November to that for December was 2 : 2.6666. The worker got 40 rupees more for December than for October and received a bonus constiuting 40% per cent of the salary for three months. Find the bonus. (Assume that the number of workdays is the same in every month.)
(a) 368.888 rupees
(b) 152.5555 rupees
(c) 222.22 rupees
(d) 265.6 rpees

55. After three successive equal percentage rise in the salary the sum of 100 rupees turned into 140 rupees and 49 paise. Find the percentage rise in the salary.
(a) 12% (b) 22%
(c) 66% (d) 82%

56. Rakesh Yadav goes to a shop to buy a sofa set costing Rs. 13,080. The rate of sales tax is 9%. He tells the shopkeeper to reduce the price of the sofa set of such an extent that he has to pay Rs. 13080 inclusive of sales tax. Find the percentage reduction needed in the price of the sofa set to just satisfy his requirement.
(a) 8.33% (b) 8.26%
(c) 9% (d) 8.5%

57. The price of a certain article was raised by 10% in India. The consumption of the same article was increased from 200 tons to 225 tons. By how much percent will the expenditure on the article rise in the Indian economy ?
(a) 24.25% (b) 22.5%
(c) 23.75% (d) 26.75%

58. In the university examination last year, Rakesh Yadav scored 65% in English and 82% in History. What is the minimum percent he should score in Sociology, which is out of 50 marks (if English and History were for 100 marks each), if he aims at getting 78% overall ?
(a) 94% (b) 92%
(c) 98% (d) 96%

59. King Dashratha, at his eleventh hour, called his three queens and distributed his gold in the following way: He gave 50% of his wealth to his first wife, 50% of the rest to his second wife and again 50% of the rest to his third wife. If their combined share is worth 1,30,900 kilograms of gold, find the quantity of gold King Dashratha was having initially?
(a) 1,50,000 kg
(b) 1,49,600 kg
(c) 1,51,600 kg
(d) 1,52,600 kg

60. The population of New Foundland increases with a uniform rate of 8% per annum, but due to immigration, there is a further increase of population by 1% (however, this 1% increase in populaion is to be calculated on the population after the 8% increase and not on the previous years population). Find what will be the percentage increase in population after 2 years.
(a) 18.984 (b) 18.081
(c) 18.24 (d) 17.91

61. 10% of Mexico's population migrated to South Asia, 10% of the remaining migrated to America and 10% of the rest migrated to Australia. If the female population, which was left in Mexico, remained only 3,64,500, find the population of Mexico city before the migration and its effects if it is given that before the migration the female population was half the male population and this ratio did not change after the migration ?
(a) 10,00,000 (b) 12,00,000
(c) 15,00,000 (d) 16,00,000

62. According to a recent survey report issued by the Commerce Ministry, Government of India, 30% of the total FDI goes to Gujarat and 20% of this goes to rural areas. If the FDI in Gujarat, which goes to urban areas is $72 m. If 20% of the total FDI goes to Andhra Pradesh and 50% of this goes to rural areas then find the size of FDI in rural Andhra Pradesh?
(a) $30 m (b) $9 m
(c) $60 m (d) $40 m

63. The cost of food accounted for 25% of the income of particular family. If the income gets raised by 20% then what should be the percentage point decrease in the food expenditure as a percentage of the total income to keep the food expenditure unchanged between the two years ?
(a) 3.5 (b) 8.33
(c) 4.16 (d) 5

64. If the length, breadth and height of a cube are decreased, decreased and increased by 5%, 5% and 20% respectively, then what will be the impact on the volume of the cube (in percentage terms)?
(a) 7.25% (b) 5%
(c) 8.3% (d) 20.75%

65. A's salary is first increased by 25% and then decreased by 20%. The result is the same as B's salary increased by 20% and then reduced by 25%. Find the ratio of B's salary to that of A's
(a) 4 : 3 (b) 11 : 10
(c) 10 : 9 (d) 12 : 11

66. A person saves 6% of his income. Two years later, his income shoots up by 15% but his savings remain the same. Find the hike in his expenditure.
(a) 15.95% (b) 15%
(c) 14.8% (d) 15.5%

67. A is 50% more than B, C is 2/3 of A and D is 60% more than C. Now, each of A, B, C and D is increased by 10%. Find what per cent of B is D (after the increase) ?
(a) 150% (b) 160%
(c) 175% (d) 176%

68. A and B have, Rs. 1200. A spends 12% of his money while B spends 20% of his money. They are then left with a sum that constitutes 85% of the whole sum. Find what amount is left with A.
(a) Rs 750 (b) Rs 800
(c) Rs 700 (d) Rs 660

69. Bhuvnesh has Rs. B and his friend Saurabh has Rs. S. Bhuvnesh spends 12% of her money and Saurabh also spends the same amount as Bhuvnesh did. What percentage of his money did Saurabh spend ?
(a) $\frac{18B}{S}$ (b) $\frac{18S}{B}$
(c) $\frac{12B}{S}$ (d) $\frac{12S}{B}$

70. In order to maximise his gain, a theatre owner decides to reduce the price of tickets by 20% and as a result of this, the sales of tickets increase by 40%. If, as a result of these changes, he is able to increase his weekly collection by Rs. 1,68,000, find by what value did the gross collection increase per day.
(a) 14,000 (b) 18,000
(c) 24,000 (d) 20,000

71. In a town consisting of three localities A, B and C, the population of the three localities A, B and C are in the ratio 9 : 8 : 3. In locality A, 80% of the people are literate, in locality B, 30% of the people are illterate. If 90% people in locality C are literate, Find the percentage literacy in that town.
(a) 61.5% (b) 78%
(c) 75% (d) None of these

72. A fraction is such that if the double of the numerator and the triple of the denominator is changed by +10% and –30% respectively then we get 11% of 16/21. Find the raction.
(a) $\frac{4}{25}$ (b) $\frac{2}{25}$
(c) $\frac{3}{25}$ (d) None of these

73. To pass an examination, 40% marks are essential. A obtains 10% marks less than the pass marks and B obtains 11.11% marks less than A. What percent less than the sum of A's and B's marks should C obtain to pass the exam ?
(a) 40% (b) 41(3/17)%
(c) 28% (d) Any of these

74. The hourly wages of a female labour are increased by 12.5% whereas the weekly working hours are reduced by 8%. Find the percentage change in the weekly wages if she was getting Rs. 1200 per week for 50 hours previously.
(a) +3.5% (b) 4%
(c) 4.5% (d) None of these

75. Two numbers X and Y are 20% and 28% less then a third number Z. Find by What percentage is the number Y less than the number X.
(a) 8% (b) 12%
(c) 10% (d) 9%

76. Price of a commodity is first increased by x% and then decreased by x%. If the new price is K/100, find the original price.
(a) (x–100) 100/K
(b) (x^2–100^2)100/K
(c) (100–x) 100/K
(d) $100K/(100^2-x^2)$

77. The salary of Rakesh Yadav is increased by Rs. 4800 and the rate of tax is decreased by 2% from 12% to 10%. If in the both cases 20% of the income is tax free then find the increased salary?
(a) Rs 32,800 (b) Rs 36,800
(c) Rs 28,000 (d) none of these

78. Rakesh Yadav goes to a shop to buy an FM radio costing Rs. 2568 including sales tax at 7%. He asks the shopkeeper to reduce the price of radio so that, he can save the amount equal to the sales tax. The reduction of the price of the radio is :
(a) Rs 180 (b) Rs 210
(c) Rs 168 (d) none of these

Direction for Question (79–81):- Read the following passage and answer the questions.

In a recent youth fete organised by Rakesh Yadav Reader's Publication the entry tickets were sold out according to the following scheme:

Tickets bought in one lot
6, 12,18 Percentage discount 10% 20% 25% Original price per ticket: Rs. 40

This offer could have been availed only when tickets were bought in a fixed lot according to the scheme and any additional ticket was available at its original price.

79. If a student has to buy 25 tickets, then what will be the minmum price per ticket ?
(a) Equal to Rs 32
(b) 32.32
(c) 31.84
(d) Cannot be determined

80. In the above question, what will be the approximate possible maximum price per ticket (if 10% discount have been availed for 24 ticket) ?
(a) Rs. 30 (b) Rs. 32
(c) Rs. 36 (d) Rs. 36.16

81. On the last day of the fete, with the objective of maximising participation, the number of tickets sold in a lot was halved with the same discount offer. Mr. Bhuvnesh is in a fix regarding the number of tickets he can buy with Rs. 532. The maximum number of tickets he can purchase with this money is
(a) 14 (b) 15
(c) 16 (d) 17

82. Of the adult population in Delhi, 45% of men and 25% of women are married. What percentage of the total population of adults is married (assume that no man marries more than one woman and vice versa)?
(a) 33.33% (b) 32.14%
(c) 31.1% (d) None of these

83. The weight of an iron bucket increases by 33.33% When filled with water to 50% of its capacity. Which of these may be 50% of the weight of the bucket when it is filled with water (assume the weight of bucket and its capacity in kg to be integers)?
(a) 7 kg (b) 6 kg
(c) 5 kg (d) 8 kg

84. Australia scored a total of x runs in 50 overs. India tied the scores in 20% less overs. If India's average run rate had been 33.33% higher the scores would have been tied 10 overs earlier. Find how many runs were scored by Australia.
(a) 250 (b) 240
(c) 200
(d) Cannot be determined

85. Due to a 25% hike in the price of rice per kilogram, a person is able to purchase 20 kg less for Rs. 400. Find the increased price per kilogram.
(a) Rs 5 (b) Rs 6
(c) Rs 10 (d) Rs 4

86. Rakesh Yadav is appointed on the basic salary of Rs. 1200 per month and the condition that for every sales of Rs. 10,000 above Rs. 10,000, he will get 50% of basic salary and 10% of the sales as a reward. This incentive scheme does not operate for the first Rs. 10000 of sales. What should be the value of sales if he wants to earn Rs. 7600 in a particular month?
(a) Rs 60,000 (b) Rs 50,000
(c) Rs 40,000 (d) None of these

87. In Question 87 Which of the following income can not be acheved in a month ?
(a) Rs 6,000
(b) Rs 9,000
(c) Both a and b
(d) Any income can be achieved

88. In an examination a candidate must score 40% marks to pass. A candidate, who gets 220 marks, fails by 20 marks. What are the maximum marks for the examination ?
(a) 1200 (b) 800
(c) 600 (d) 450

89. A family's ratio of savings to expenditure for last month was 2 : 13. This month, due to unforseen expenditure, savings fell to 50% of the amount saved last month. Salary, last month was Rs. 10,000. This month there was increase of 15% in the salary. How much did the family spend this month?
(a) Rs. 667.33
(b) Rs. 11,167.33
(c) Rs. 9,833.33
(d) Rs. 10,833.33

90. The price of raw materials has gone up by 15%, labour cost was 25% on old price of raw material and now labour cost is 30% on new price of raw material. By how much percentage should there be a reduction in the usage of raw materials so as to keep the cost same?
(a) 16.38% (b) 18.24 %
(c) 28 % (d) 25 %

91. Mr. Rakesh Yadav is a computer programmer. He is assigned three jobs for which time allotted is in the ratio of 5 : 4 : 2 (jobs are needed to be done individually). But due to some technical snag, 10% of the time allotted for each job gets wasted. Thereafter, owing to the lack of interest, he invests only 40%, 30%, 20% of the hours of what was actually allotted to do the three jobs individually. Find how much percentage of the total time allotted is the time invested by X.
(a) 38.33% (b) 39.4545%
(c) 32.72% (d) 36.66%

92. In the Mock SSC paper , questions were asked in five sections. Out of the total students, 5% candidates cleared the cut-off in all the sections and 5% cleared none. Of the rest, 25% cleared only one section and 20% cleared four sections. If 24.5% of the entire candidates cleared two sections and 300 candidates cleared three sections, find out how many candidates appeared at the Mock SSC?
(a) 1000 (b) 1200
(c) 1500 (d) 2000

93. There are three galleries in a coal mine. On the first day, two galleries are operative and after some time, the third gallery is made operative. With this, the output of the mine became half as large again. What is the capacity of the second gallery as a percentage of the first, if it is given that a four-month output of the first and the third galleries was the same as the annual output of the second gallery?
(a) 70% (b) 64%
(c) 60% (d) 65%

94. Rakesh Yadav has some amount with him 25% of it is stolen in a bus, 10% is lost through a hole in the pocket, 50% of the remaining is spent on food. He then, purchases a book worth Rs. 26 from the remaining. He walks back home because all his money is over. What was the initial amount?
(a) Rs. 160 (b) Rs. 1230
(c) Rs. 90 (d) Rs. 80

95. In an election there are 3 candidates Rakesh Yadav, Bhuvnesh and Saurabh.Rakesh Yadav gets 50% more votes than Bhuvnesh. Rakesh Yadav also beats Saurabh by 1,80,00 votes. If it is known that, Bhuvnesh gets 5 percentage point more votes than Saurabh, find the number of voters on the voting list (given 90% of the voters on the voting list voted and no votes were illegal.)
(a) 72,000 (b) 81,000
(c) 90,000 (d) 1,00,000

96. The petrol prices shot up by 7% as a result of the hike in the price of crudes. The price of petrol before the hike was Rs. 28 per litre. Vawal travels 2400 kilometres every month and his car gives a mileage of 18 kilometres to a litre. Find the increase in the expenditure that Vawal has to incur due to the increase in the price of petrol (to the nearest rupee)?
(a) Rs. 270 (b) Rs. 262
(c) Rs. 276 (d) Rs. 272

97. A shopkeeper announces a discount scheme as follows : for every purchase of Rs. 3000 to 6000, The customer gets a 15% discount of a ticket that entitles him to get a 7% discount on a further purchase of goods costing more than Rs. 6000. The customer, however, would have the option of reselling his right to the shopkeeper at 4% of his initial purchase value (as per the right refers to the 7% discount ticket.) In an enthusiastic response to the scheme, 10 people purchase goods worth Rs. 4000 each. Find the maximum, possible revenue for the shopkeeper.
(a) Rs. 38,400 (b) Rs. 38,000
(c) Rs. 39,400 (d) Rs. 39,000

98. Rakesh Yadav has 72% vision in his left eye and 68% vision in his right eye. On corrective therapy, he starts wearing contact lenses, which augment his vision by 15% in the left eye and 11% in the right eye. Find out the percentage of normal vision that he possesses after corrective therapy. (Assume that a person's eyesight is a multiplicative construct of the eyesight's of his left and right eyes)
(a) 52.5% (b) 62.5%
(c) 72.5% (d) 68.6%

99. The sum of the numbers of boys and girls in a school is 150. If the number of boys is x, the number of girls becomes x % of the total number of students. The number of boys is :
(a) 90 (b) 50
(c) 40 (d) 60

100. The population of Mukherjee Nagar is 700. If it increases by 7.14% per annum (i.e., every year). Find the population of the Mukherjee Nagar after one year.
(a) 630 (b) 490
(c) 750 (d) 980

101. A cricket team played 24 matches. The team won 9 matches and lost 3 matches. 12 matches ended in draw. What per cent of the total matches did the team lose ?
(a) $16\frac{2}{3}\%$ (b) $12\frac{1}{2}\%$
(c) 25% (d) $33\frac{1}{33}\%$

102. Rakesh Yadav gives 10% to his wife, 10% of the remaining to a hospital (as a donation) and gain 10% of the remaining to prime minister's relief Fund. Then he has only 7290 Rs. with him. What was the initial sum of money of Rakesh Yadav.
(a) 8,100 (b) 9,000
(c) 12,00 (d) 10,000

103. Initially Rakesh Yadav had n chocolates. A customer bought 10% chocolate from n then another customer bought 20% of the remaining chocolates, after that one more customer purchased 25% of the remaining chocolates. Finally Rakesh Yadav is left with 270 chocolates in his shop. How many chocolates were there initially in his shop?
(a) 300 (b) 450
(c) 500 (d) 600

104. Bhuvnesh is a very expert in bargaining. Once he went to a nearby shop. When Bhuvnesh asked the price of Shampoo the shopkeeper told her the price by increasing 15% of the original cost. But Bhuvnesh insisted to decrease the price by 15% so the shopkeeper sold it by decreasing the price by 15%. What is the loss or profit of shopkeeper and by how much percent?
(a) No loss (b) profit of 1.5%
(c) loss of 2.25%
(d) None of these

105. A's salary is half that of B. If A got a 50% rise in his salary and B got a 25% rise in his salary, then the percentage increase in combined salaries of both is.
(a) 30% (b) 33.33%
(c) 55% (d) 28%

106. In our Mukherjee Nagar's office there are 60% female employees. 50% of all the male employees are computer literate. If there are total 62% employees computer literate out of the total 1600 employees, then the no. of female employees who are computer literate:
(a) 690 (b) 672
(c) 960
(d) Can't be determined

107. A shopkeeper charges sales tax of x% up to Rs. 2,000 and above it he charges y %. A customer pays total tax of Rs 320, when he purchases the goods worth Rs. 6,000 and he pay's the total tax of Rs. 680 for the goods worth Rs. 12,000. The value of $(x - y)$ is:
(a) 0 (b) – 2
(c) – 4 (d) 5

108. 40% of a number when added to the square of the same number, then it is increased to 4040% of itself the actual number is:
(a) 175 (b) 400
(c) 40 (d)120

109. 600 students took the test on physics and chemistry. 35% students failed in Physics and 45% students failed in chemistry and 40% of those who passed in chemistry also passed in Physics, then how many students failed in both:
(a) 162 (b) 138
(c) 60 (d) None of these

110. Rakesh Yadav's salary is Rs. 12,345 per month. The salary of his brother is 10% greater

than that of his salary. The salary of his only sister is 9.09% greater than his only brother. The salary of his wife is $56\frac{12}{23}\%$ less than the total salary of his brother and sister together, then the salary of his wife is:

(a) greater than his sister's salary

(b) $33\frac{11}{23}\%$ less than his sister's salary

(c) equal to his salary

(d) $44\frac{11}{23}\%$ greater than his own salary

111. NDTV is a very popular TV channel. It telecasts the programmes from 8:00 a.m. to 12:00 a.m. (Midnight). It telecasts 60 advertisements each of 8 seconds and 16 advertisements each of 30 seconds. What is the percentage of time devoted in a day for the advertisements ?
(a) 1.5% (b) 1.66%
(c) 2% (d) 2.5%

112. Lagaan is levied on the 60% of the cultivated land. The revenue department collected total Rs. 3,84,000 through the lagaan from the village of Rakesh Yadav. Rakesh Yadav, a very rich farmer, paid only Rs. 480 as lagaan. The percentage of total land of Rakesh Yadav over the toal taxable land of the village is:
(a) 0.15% (b) 1.5%
(c) 0.125% (d) 0.208%

113. The cost of packaging of the mangoes is 40% the cost of fresh mangoes themselves. The cost of mangoes increased by 30% but the cost of packaging decreases by 50%, then the percentage change of the cost of packed mangoes, if the cost of packed mangoes is equal to the sum of the cost of fresh mangoes and cost of packaging.
(a) 14.17% (b) 7.14%
(c) 6.66% (d) None of these

114. Bhuvnesh scores 80% in Physics and 66% in chemistry and the maximum marks of both the papers are 100. What per cent does he score in maths which is of 200 marks, if he scores 80% marks in all the three subjects:
(a) 74% (b) 84%
(c) 87% (d) 83%

115. Three candidates A, B and C contested an election. Out of the total votes on a voter list 25% did not vote and 6.66% votes polled were invalid. C got 2450 valid votes, which were 40% more than that of B. If A got only 40% of the total votes, then who is the winner ?
(a) A (b) B
(c) C
(d) can't be determined

116. The monthly salary of Bhuvnesh and Saurabh together is $ 28,000. The salary of Bhuvnesh and Saurabh is increased by 25% and 12.5% respectively then the new salary of Saurabh becomes 120% of the new salary of Bhuvnesh. The new (or increased) salary of Bhuvnesh is:
(a) $ 15,000 (b) $ 18,000
(c) $ 14,000 (d) $ 16,000

117. The shopkeeper increased the price of a product by 25% so that customer finds it difficult to purchase the required amount. But somehow the customer managed to purchase only 70% of the required amount. What is the net difference in the expenditure on that product ?
(a) 10% more (b) 5% more
(c) 12.5% less (d) 17.5% less

118. In the previous government, party Q was in the opposition. Now increasing the seats by 33.33% Q is the ruling party and thus party Q enjoys twice the majority than that of party P in the previous government. If there were only two parties P and Q and the fix no. of seats be 500 in the parliament of Hum-Tum, then the no. of seats of the Q in the new government is:
(a) 225 (b) 200
(c) 275 (d) 300

119. In a school there are 1800 students. Last day except 4% of the boys all the students were present in the school. Today except 5% of the girls all the students are present in the school, but in both the days no. of students present in the school, were same. The no. of girls in the school is :
(a) 1200 (b) 800
(c) 1000 (d) 600

120. In a test there are total n questions. Rakesh Yadav answers 20 out of 25 questions correctly in the first section. In the second section he answers 60% question correct and thus his total score is 66.66% in the test. Given that all the questions carry equal marks, without any negative marking. The total no. of question in the test is :
(a) 50 (b) 60
(c) 75 (d) 100

121. Radha spends 40% of her salary on food, 20% on house rent, 10% on entertainment and 10% on conveyance. If her savings at the end of a month are Rs. 1500, then her salary per month (in Rs.) is :
(a) 8000 (b) 7500
(c) 6000 (d) 10000

122. In an election between two candidates, one got 55 % of the total valid votes, 20 % of the votes are invalid. If the total votes are 75000, what is the number of valid votes that the other person got ?
(a) 2700 (b) 2900
(c) 3000 (d) 3100

123. A Rakesh Yadav gets commission on total sales at 9%. If the sales is exceeded Rs. 10,000 he gets an additional commission as bonus of 3% on the excess of sales over Rs. 10,000. If he gets total commission of Rs. 1380, then the bonus he received is:
(a) Rs. 180 (b) Rs. 120
(c) Rs. 480
(d) Data insufficient

124. A businessman's earning increases by 25 % in one year but decreases by 4 % in the next. After 5 years his total earnings would be Rs. 72,000. What is his present earning?
(a) Rs. 10,000 (b) Rs. 40,000
(c) Rs. 80,000 (d) Rs. 54,000

125. A man invests Rs. 1,200 at 10 % p.a. At the end of the year he withdraws 30 % of total amount and pays Rs. 24 as transaction fee. At the end of 2nd year he withdraws 30 % of the amount ans pays Rs. 93 as transaction fee. What is the balance at the end of the third year?
(a) Rs. 660 (b) Rs. 825
(c) Rs. 500 (d) Rs. 770

126. The average earning of each member of the Ambani family is 20% less than the average earnings of each member of the Sahara family and the total earnings of Ambani's family is 20% more than the total earning of Saharas's family. The no. of family members in the Sahara is what per cent of the no. of family members of Ambani:
(a) 25% (b) 20%
(c) 66.66% (d) None of these

127. From 2000 onwards, till 2003 the price of computers increased every year by 10%. After that due to government subsidy the price of computers decreases every year by 10%. The price of a computer in 2006 will be approx. how much per cent less than the price in 2000 if the same pattern of price is continued:
(a) 2 (b) 3
(c) 4 (d) None of these

128. A book consists of 30 pages, 25 lines on each page and 35 characters on each line. If this content is written in another note book consisting of 30 lines and 28 characters per line, then the required no. of pages will how much per cent greater than the previous pages ?
(a) 4.16% (b) 5%
(c) 6.66% (d) None of these

129. The rate of increase of the price of sugar is observed to be 2% more than the inflation rate expressed in percentage. The price of sugar on January 1, 2004 is Rs. 20 per kg. The inflation rates of the years 2004 and 2005 are expected to be 8% each. The expected price of sugar on January 1, 2006 would be:
(a) Rs. 23.60 (b) Rs. 24.00
(c) Rs. 24.20 (d) Rs. 24.60

130. In the Regional Science Centre, Lucknow the rate of ticket is increased by 50% to increase the revenue, but simultaneously 20% of the visitors decreased. What is percentage change in the revenue of Regional Science Centre.
(a) + 20% (b) – 25%
(c) + 30%
(d) Can't be determined

131. On Jan 1, 2014 my salary decreased from Rs. 20,000 to Rs. 18,000. Simultaneously the rate of income tax decreased by 37.5 %. If so the amount of income tax paid by me remains constant, what is the value of income tax I pay :
(a) Rs. 6,000 (b) Rs. 12,000
(c) Rs. 8,000
(d) can't be determined

132. Selling price of a shirt and a coat is Rs. 4000. The cost price of a shirt is 58.33% of the cost price of a coat and so amount of profit on both the shirt and coat is same, then the price of the shirt could be : (a) Rs. 2100
(b) Rs. 2525
(c) Rs. 2499 (d) Rs. 1120

133. On the April 1, 2005 my salary increased from Rs. 10,000 to Rs. 16,000. Simultaneously the rate of income tax decreased by 37.5%, So the amount of income tax paid by me remains constant what is the value of income tax paid by me:
(a) Rs. 3000 (b) Rs. 6000
(c) Rs. 1600
(d) Can't be determined

134. In a class, the no. of boys is more than the no. of girls by 12%. The ratio of boys to girls is:
(a) 15 : 11 (b) 14 : 11
(c) 25 : 28 (d) 28 : 11

135. A customer asks for the production of x number of goods. The company produces y number of goods daily. Out of which z% are unfit for sale. The order will be completed in:
(a) $\frac{x}{100y\,(1-z)}$ days
(b) $\frac{100yz}{x}$ days
(c) $\frac{100x}{y(100-z)}$ days
(d) $\frac{100}{y(z-1)}$ days

136. In a town, the population was 8000. In one year, male population increased by 10% and female population increased by 8 % but the total population increased by 9%. The number of males in the town was:
(a) 4,000 (b) 45,00
(c) 5,000 (d) 6,000

137. A fraction is reduced such that when it is squared and then its numerator is increased by 25% and the denominator is reduced to 80% it results in 5/8 of the original fraction. The product of the numerator and denominator is:
(a) 6 (b) 12
(c) 10 (d) 7

138. In the Yadav's family the ratio of expenses to the savings is 5 : 3. But his expenses is increased by 60% and income increases by only 25% thus there is a deficit of Rs. 3500 in savings. The increased income of Rakesh Yadav's family is :
(a) Rs. 35,000 (b) Rs. 28,000
(c) Rs. 25,000 (d) Rs. 18,500

139. In the Presidency College two candidates contested a presidential election. 15% of the voters did not vote and 41 votes were invalid. The elected contestant got 314 votes more than the other candidate. If the elected candidate got 45% of the total votes in the voting list. The individual votes of each candidates are :
(a) 2250 and 1936
(b) 3568 and 3254
(c) 2442 and 2128
(d) 2457 and 2143

140. The annual earning of Mr. Rakesh Yadav is Rs. 4 lakhs per annum for the first year of his job and his expenditure was 50%. Later on for the next 3 years his average income increases by Rs. 40,000 per annum and the saving was 40%, 30% and 20% of the income. What is the percentage of his total savings over the total expenditure if there is no interest is applied on the savings for these four years.
(a) $49\frac{37}{87}\%$ (b) $41\frac{73}{83}\%$
(c) 53% (d) None of these

141. In an election only two candidates contested 20% of the voters did not vote and 120 votes were declared as invalid. The winner got 200 votes more than his opponents thus he secured 41% votes of the total voters on the voter list. Percentage votes of the defeated candidate out of the total votes casted is:
(a) 47.5% (b) 41%
(c) 38% (d) 45%

142. A, B, C and D purchased a Batra-multiplex for Rs. 56 lakh. The contribution of B, C and D together is 460% that of A, alone. The contribution of A, C and D together is 366.66% that of B's contribution and the contribution of C is 40% that of A, B and D together. The amount contributed by D is :
(a) 10 Lakh (b) 12 Lakh
(c) 16 Lakh (d) 18 Lakh

143. In a village three people contested for the post of village Pradhan. Due to their own interest, all the voters voted and no one vote was invalid. The losing candidate got 30% votes. What could be the minimum absolute margin of votes by which the winning candidate led by the nearest rival, if each candidate got an integral per cent of votes ?
(a) 4 (b) 2
(c) 1 (d) None of these

144. Every day a mango seller sells half his stock, 10% of the stock overnight gets spoiled. If 1983 mangoes rotted over 3 nights then how many did he start with on the first day ?
(a) 25,000 (b) 24,000
(c) 30,000 (d) 32,000

145. A man lost half of his initial amount in the gambling after playing 3 rounds. The rule of gambling is that if he wins he will receive Rs. 100, but he has to give 50% of the total amount after each round. Luckily he won all the three rounds. The initial amount with which he had started the gambling was :
(a) $\frac{500}{3}$ (b) $\frac{700}{3}$
(c) 300 (d) 600

146. The price of an article was decreased by 10% and again reduced by 10%. By what percent should the price have been reduced once, in order to produce the same effect as these two successive reductions?
(a) 15 (b) 19
(c) 20 (d) 25

147. 8 % of the voters in an election did not cast their votes. In this election, there were only two candidates. The winner by obtaining 48% of the total votes defeated his contestant by 1100 votes. The total number of voters in the election was:
(a) 21000 (b) 23500
(c) 22000 (d) 27500

148. In every month Rakesh Ydadav consumes 25 kg rice and 9 kg wheat. The price of rice is 20% of the price of wheat and thus he spends total Rs. 350 on the rice and wheat per month. If the price of wheat is increased by 20% then what is the percentage reduction of rice consumption for the same expenditure of Rs. 350 ? Given that the price of rice and consumption of wheat is constant.
(a) 36% (b) 40%
(c) 25% (d) 24%

149. A person gave 20% of his income to his elder son, 30% of the remaining to the younger son and 10% of the balance, he donated to a trust.He is left with Rs. 10080. His income was :
(a) Rs. 50000 (b) Rs. 40000
(c) Rs. 30000 (d) Rs. 20000

150. P% of the students of a class passed the exam. In the passed students g% are the girls and in the failed students b% are the boys. The percentage of passed boys over the failed girls is:
(a) $\left(\frac{bg}{p} \times 100\right)$
(b) $\frac{100(100-g)p}{(100-p)(100-b)}$
(c) $\frac{(100-g)(100-b)}{(100-p)}$
(d) None of these

151. In an election between two candidates, 75% of the voters cast their votes, out of which 2% votes declared invalid. A candidate got 9261 votes which were 75 % of the valid votes. The total number of voters enrolled in that election was:
(a) 16000 (b) 16400
(c) 16800 (d) 18000

152. Two numbers are in the ratio 2 : 3. If the 20 % of the smaller number added to 20 is equal to the sum of 10% of the larger number and 25, then the smaller number is :
(a) 100 (b) 160
(c) 180 (d) 200

153. The pressure of a definite mass of a gas is directly proportional to the temperature and inversely proportional to the volume under the given conditions. If temperature is increased by 40% and the volume is decreased by 20% then the new pressure will :
(a) increased by 75%
(b) reduce to 25%
(c) increased by 20%
(d) increased by 28%

154. A computer typist types a page with 20 lines in 10 minutes but he leaves 8 % margin on the left side of the page. Now he has to types 23 pages with 40 lines on each page and leaves 25% more margin than before. How much time is now required to type these 23 pages.
(a) $7\frac{1}{2}$ hrs (b) $7\frac{2}{3}$ hrs
(c) $23\frac{1}{2}$ hrs (d) 3.916 hrs

155. In Sabarmati Express, there are as many wagons as there are the no. of seats in each wagon and not more than one passanger can have the same berth (seat). If the middlemost compartment carrying 25 passangers is filled with 71.428% of its capacity, then find the maximum no. of passangers in the train that can be accommodated if it has minimum 20% seats always vacant.
(a) 500 (b)786
(c) 980
(d) Can't be determined

156. In the half yearly exam only 70% of the students were passed. Out of these (passed in half yearly) only 60% student are passed in annual exam. Out of those who did not pass the half yearly exam, 80% passed in annual exam. What per cent of the students passed the annual exam?
(a) 42% (b) 56%
(c) 66% (d) None of these

157. The monthly income of a person was Rs. 13,500 and his monthly expenditure was Rs. 9,000. Next year his income increased by 14 % and his expenditure increased by 7%. The percent increase in his savings was :
(a) 7 (b) 21
(c) 28 (d) 35

158. In an office there were initially n employees. The HR manager first hired p% employees then after a month q% employees left the office, then there were finally n employees remained in the office, the value of $p - q$ is:
(a) pq (b) $\frac{pq}{100}$
(c) $\frac{p}{q}$ (d) None of these

159. In the Mukherjee Nagar, Delhi a shopkeeper first raises the price of a Jewellery by x % then he decreases the new price by x %. After one such up down cycle, the price of a Jewellery decreased by Rs. 21025. After a second updown cycle the jewellery was sold for Rs. 484416. What was the original price of the jewellery.
(a) Rs. 5,00,000
(b) Rs. 6,00,625
(c) Rs. 5,25,625
(d) Rs. 5,26,000

160. The amount of work in Rakesh Yadav Readers Publication is increased by 50%. By what per cent is it necessary to increase the number of workers to complete the new amount of work in previously planned time, if the productivity of the new labour is 25% more.
(a) 60% (b) 66.66%
(c) 40% (d) 33.33%

161. The number of students who opted for I T course decreased by 23%. If the number is 1540 now, then original number of students opting for IT course was:
(a) 1,600 (b) 1,800
(c) 2,000 (d) 2,200

162. If the height of a cone is increased by 200%, then its volume will be increased by:
(a) 100% (b) 200%
(c) 250% (d) 300%

163. In an examination A got marks 10% less than B, B got marks 25% more than C, C got marks 20% less than D. If A got 360 marks out of 500, then D got marks:
(a) 70% (b) 75%
(c) 80% (d) 85%

163. An increase of 25% in entrance fee in a show follows a decrease of 30% in the number of daily viewers. What is the effect of this on total revenue?
(a) Decrease $8\frac{1}{2}\%$
(b) Increase $8\frac{1}{2}\%$
(c) Increase $12\frac{1}{2}\%$
(d) Decrease $12\frac{1}{2}\%$

164. According to survey, there are 2 or more persons in 40% houses, out of the houses with one person, there was one man only in 25% houses. Find the percentage of those houses in which there live only one woman and no man out of all the houses.
(a) 75 (b) 40
(c) 15 (d) 45

165. The marks of Bhuvnesh in Chemistry are 60% of the marks in Mathematics and marks in Mathematics are 60% of the marks in Physics. How many marks he got in Chemistry, if the marks in these three subjects are 147 in all?
(a) 27 (b) 45
(c) 75 (d) None of the above

166. Daily wages of A, B and C are Rs. 333. If they spend 80% 85% and 75% of their wages, respectively, then their savings are in the ratio of 7 : 6 : 9. What are the daily wages of B' ?
(a) Rs. 120 (b) Rs. 105
(c) Rs. 108 (d) Rs. 115

167. In a Rakesh Yadav Readers Publication 40% books are of English, 80% of the rest books are of Hindi and remaining 300 books are of other languages. The number of books in the Publication is :
(a) 2,000 (b) 1,500
(c) 2,500 (d) 3,500

168. In an election between two candidates, first candidate got 80% of the total valid votes. If 10% of the total 1,80,000 votes were declared invalid, then the number of valid votes polled in favour of the second candidate is
(a) 31,400 (b) 31,500
(c) 32,400 (d) 32,420

169. The number of seats in a cinema hall is increased by 25%. the cost of a ticket is also increased by 10%. The overall percentage increase in the revenue is:
(a) 10.5 (b) 27.5
(c) 37.5 (d) 40.5

170. Bhuvnesh invests 7% (i.e., Rs. 2,170) of his monthly income in Mutual Fund. After that 18% of his income invests in Recurring Deposit Account. He invests 6% of his income in NSC. What is the annual investment of Bhuvnesh.
(a) Rs. 1,25,320
(b) Rs. 1,13,520
(c) Rs. 1,35,120
(d) Rs. 1,15,320

171. In an Examination the first student got 28% marks and failed by 12 marks. While in the same examination the second student got 30% marks and failed by 6 marks. Find the the maximum marks in the examination and also find minimum pass marks–
(a) 200, 66 (b) 300, 96
(c) 500, 156 (d) 1000, 306

172. In an examination a student got 32% marks and failed by 4 marks. While an another student got 35% marks and got 5 marks more than pass marks. Find the maximum marks in the examintaion.
(a) 500 (b) 200
(c) 300 (d) None of these

173. Rakesh Yadav spends 18% of his income on food and education, 25% on house and transportation, 24% on insurance and he deposits 20% in the bank if he is left with Rs. 19500 then find his total income.
(a) 1,00,000 (b) 2,00,000
(c) 4,00,000 (d) 1,50,000

174. A person gives 40% of his income to A and then he gives 25% of the remaining to B and again he gives 50% on the remaining to C. If he is left with Rs. 2160, find his total initial income?
(a) 8,000 (b) 9600
(c) 10,000 (d) 8500

175. In an examination 65% students failed in Maths and 75% students failed in English while 52% students failed in both the subjects. If 48 students passed in both the subjects then find the total number of students appeared in the examination.
(a) 400 (b) 500
(c) 200 (d) None of these

176. In a group every person takes either tea or coffee or both. If 72% persons take tea and 44% persons take coffee. If there are 192 persons who take both tea and coffee, then find total number of persons in the group.
(a) 1000 (b) 1200
(c) 1500 (d) 800

177. In a fraction the numerator is 4 less than its denominator. If the numerator is increased by 32% and the denominator is

increased by 75% then the resultant fraction becomes $\frac{12}{25}$. Find the original fraction.

(a) $\frac{3}{7}$ (b) $\frac{5}{9}$

(c) $\frac{7}{11}$ (d) $\frac{9}{13}$

178. If the price of sugar is decreased by 20%, a person can buy 2 kg more sugar for 360 rupees. Find the original and present price of sugar/kg.
(a) 45, 36 (b) 40,32
(c) 30, 24 (d) 60, 48.

179. In an exam a student got 32.2% marks and he was failed by 28 marks. While an another student got 45% marks and he passed getting 36 marks more than minimum marks required to pass. Find the minumum marks percentage required to pass in the exam.
(a) 37% (b) 37.8%
(c) 40% (d) 40.5%

180. In an exam 900 girls 1100 boys appeared. In which 40% of girls and 50% of the boys passed the exam. Find the percentage of failed students.
(a) 45 (b) 45.5
(c) 54.5 (d) 59.2

181. Rakesh Yadav spends 20% of his salary on the education of his son. In the next month when his salary increases by 170 rupees he decides to spend half of the increased also on the education of his son. In this way his present expenditure on son's education becomes Rs. 645. Find his initial salary.
(a) Rs. 2400 (b) Rs. 2600
(c) Rs. 2800 (d) Rs. 3600

182. In an examintion there are three subjects Geography, History and Sanskrit having maximum marks 120, 140, 100 respectively. A student gets 40%, 55% and 45% in Geography, History and Sanskrit respectively. If he wants to get 60% marks in four subjects then how many marks he must obtain in maths of maximum marks 180?
(a) 127 (b) 133
(c) 154 (d) 160

183. When a train starts it is carrying 240 passengers. At the first station 12 passengers got down and 22 passengers get into the train. At the second station 20% of the passengers got down and at the third station 32 passenger get into the train and some passenger got down and now finally there are 80% passengers in the train. Find the number of passenger who got down at the third station.
(a) 44 (b) 40
(c) 30 (d) 26

184. If the price of edible items has been increased by 10% and the price of other commodities is increased by 15%. If the ratio of expenditure on edible items and other commodities of a person be 2:5 and his salary be Rs. 3500. Then how many rupees must be increased in his salary so that he can consume the same quantity as before
(a) 300 (b) 350
(c) 375 (d) 475

185. Three shopkeepers promised to sell their goods at the marked price. A gives two successive discounts of 25% and 15%, B gives two successive discounts of 10% and 30% while C gives a single discount of 36%. Whose scheme is the best for customer?
(a) A (b) B
(c) C (d) A, B and C all

186. In a 200 grams mixture of water, spirit and alcohol the quantity of water, spirit, alcohol are 20%, 30% and 50% respectively. If 20 gm alcohol is added to the mixture and the quantity of water be doubled in the mixture then find their respective ratio of their quantities in the mixture.
(a) 4 : 3 : 6
(b) 2 : 3 : 4
(c) 4 : 4 : 7
(d) None of these

187. In an election there were only three candidates. 10% of the total votes could not be cast and 10,000 votes were found invalid. The winning candidate got 52% of the valid votes and the candidate at third position got 12% votes. If the candidate at second position got 28800 votes, then find the total number of votes.
(a) 90,000
(b) 99000
(c) 1,00,000
(d) None of these

188. In an election there are three candidates. The winning candidate got 55% votes and the candidate at the third place got 5% of the votes. If the winning candidate win by 9000 votes then find total number of votes while no vote was invalid.
(a) 60,000 (b) 12,000
(c) 48,000 (d) 50,000

189. While measuring the base of triangle it has been taken in 40% excess and its height was measured 40% less. Find the percentage change in its area.
(a) 16% increase
(b) 16% decrease
(c) 4% increase
(d) 4% decrease