CHAPTER

5 Percentage

1. If A's income is 50% less than that of B's, then B's income is what per cent more than that of A? **(SSC CGL 1st Sit. 2010)**
(a) 125 (b) 100
(c) 75 (d) 50

2. 1.14 expressed as a per cent of 1.9 is **(SSC CGL 1st Sit. 2010)**
(a) 6% (b) 10%
(c) 60% (d) 90%

3. If 60% of A = $\frac{3}{4}$ of B, then A : B is **(SSC CGL 1st Sit. 2010)**
(a) 9 : 20 (b) 20 : 9
(c) 4 : 5 (d) 5 : 4

4. Two successive price increases of 10% and 10% of an article are equivalent to a single price increase of **(SSC CGL 2nd Sit. 2010)**
(a) 19% (b) 20%
(c) 21% (d) 22%

5. If A's income is 25% less than B's income, by how much percent is B's income more than that of A? **SSC CGL 2nd Sit. 2010)**
(a) 25 (b) 30
(c) $33\frac{1}{3}$ (d) $66\frac{2}{3}$

6. If an electricity bill is paid before due date, one gets a reduction of 4% on the amount of the bill. By paying the bill before due date a person got a reduction of ` 13. The amount of his electricity bill was **(SSC CGL 2nd Sit. 2010)**
(a) ` 125 (b) ` 225
(c) ` 325 (d) ` 425

7. If 90% of A = 30% of B and B = 2x % of A, then the value of x is **(SSC CGL 1st Sit. 2011)**
(a) 450 (b) 400
(c) 300 (d) 150

8. If 30% of A is added to 40% of B, the answer is 80% of B. What percentage of A is B? **(SSC CGL 2011)**
(a) 30% (b) 40%
(c) 70% (d) 75%

9. If 90% of A = 30% of B and B = x% of A, then the value of x is **(SSC CGL 2011)**
(a) 800 (b) 300
(c) 700 (d) 400

10. First and second numbers are less than a third number by 30% and 37% respectively. The second number is less than the first by **(SSC CGL 2011)**
(a) 7% (b) 4%
(c) 3% (d) 10%

11. The population of a town is 15000. If the number of males increases by 8% and that of females by 10%, then the population would increase to 16300. Find the number of females in the town. **(SSC CGL 2012)**
(a) 4000 (b) 6000
(c) 3000 (d) 5000

12. The number 20% more than 80 is **(SSC CGL 2012)**
(a) 36 (b) 30 (c) 90 (d) 96

13. The number of seats in an auditorium is increased by 25%. The price of a ticket is also increased by 12%. Then the increase in revenue collection will be **(SSC CGL 1st Sit. 2012)**
(a) 40% (b) 35% (c) 45% (d) 48%

14. The salary of an employee increases every year in the month of July by 10%. If his salary in May 2000 was ` 15,000, his salary in October 2001 was **(SSC Sub. Ins. 2012)**
(a) ` 16,500 (b) ` 18,000
(c) ` 18,150 (d) ` 19,965

15. 72% of the students of a certain class took Biology and 44% took Mathematics. If each student took Biology or Mathematics and 40 took both, the total number of students in the class was **(SSC Sub. Ins. 2012)**
(a) 200 (b) 230 (c) 250 (d) 320

16. A team played 40 games in a season and won in 24 of them. What percent of games played did the team win ? **(SSC CHSL 2012)**
(a) 70% (b) 40%
(c) 60% (d) 35%

17. If 125% of x is 100, then x is : **(SSC CHSL 2012)**
(a) 80 (b) 150 (c) 400 (d) 125

18. In a big garden 60% of the trees are coconut trees, 25% of the number of coconut trees are mango trees and 20% of the number of mango trees are apple trees. If the number of apple trees are 1500. then the number of trees in the garden is : **(SSC Sub. Ins. 2013)**
(a) 48000 (b) 50000
(c) 51000 (d) 45000

19. A certain amount of money is divided among x, y and z. If x receives 25% more than y and y receives 25% less than z, then x : y : z is equal to **(SSC Multi-Tasking 2013)**
(a) 12 : 10 : 11 (b) 14 : 12 : 13
(c) 15 : 12 : 16 (d) 10 : 9 : 12

20. Two persons contested an election of Parliament. The winning candidate secured 57% of the total votes polled and won by a majority of 42,000 votes. The number of total votes polled is **(SSC Multi-Tasking 2013)**
(a) 4,00,000 (b) 5,00,000
(c) 6,00,000 (d) 3,00,000

21. A number when reduced by 10% gives 30. The number is **(SSC Multi-Tasking 2013)**

(a) 35 (b) $33\frac{1}{2}$

(c) $33\frac{1}{3}$ (d) 40

22. In the annual examination Mahuya got 10% less marks than Supriyo in Mathematics. Mahuya got 81 marks. The marks of Supriyo are **(SSC CHSL 2013)**

(a) 89 (b) 90 (c) 87 (d) 88

23. Given A is 50% larger than C and B is 25% large than C, then A is what percent larger than B? **(SSC CGL 1st Sit. 2013)**

(a) 20% (b) 25%

(c) 50% (d) 75%

24. A box has 100 blue balls, 50 red balls, 50 black ball. 25% of blue balls and 50% of red balls are taken away. percentage of black balls at present is **(SSC CGL 2nd Sit. 2013)**

(a) $33\frac{1}{3}\%$ (b) 40% (c) 50% (d) 25%

25. Rakesh got 273 marks in an examination and scored 5% more than the pass %. If Lokesh got 312 marks, then by what % above the pass mark did he pass the examination? **(SSC CGL 2nd Sit. 2013)**

(a) 20% (b) 27%

(c) 25% (d) 15%

26. In a school, 10% of number of girls is equal to 20^{th} of number of boys. Ratio between the number of boys to number of girls is **(SSC CGL 2nd Sit. 2013)**

(a) 1 : 2 (b) 2 : 1

(c) 1 : 4 (d) 4 : 1

27. A sales representative will receive a 15% commission on a sale of ` 2,800. If he has already received an advance of ` 150 on that commission, the remaining amount of commission is **(SSC Multitasking 2014)**

(a) ` 320 (b) ` 420

(c) ` 120 (d) ` 270

28. In an examination 75% candidates passed in English and 60% passed in Mathematics. 25% failed in both and 240 passed the examination. Find the total number of candidates. **(SSC Sub. Ins. 2014)**

(a) 492 (b) 300 (c) 500 (d) 400

29. If 40% of $\frac{4}{5}$ of $\frac{3}{4}$ of a number is 48, then what is 1% of the same number ? **(SSC Sub. Ins. 2014)**

(a) 20 (b) 2

(c) 10 (d) 1

30. 1% of 1% of 25% of 1000 is **(SSC CHSL 2014)**

(a) .025 (b) .0025

(c) .25 (d) .000025

31. The monthly salaries of A and B together amount to ` 40,000. A spends 85% of his salary and B, 95% of his salary. If now their savings are the same, then the salary (in `) of A is **(SSC CGL 2014)**

(a) 10,000 (b) 12,000

(c) 16,000 (d) 18,000

32. The height of a triangle is increased by 10%. To retain the original area of the triangle, its corresponding base must be decreased by: **(SSC Sub. Ins. 2015)**

(a) $9\frac{1}{8}\%$ (b) $9\frac{1}{11}\%$ (c) 10% (d) $9\frac{1}{7}\%$

33. A number is increased by x%, to get back to the original number, it is to be reduced by : **(SSC Sub. Ins. 2015)**

(a) $\frac{10x}{100+x}\%$ (b) $\frac{100x}{100+x}\%$

(c) x% (d) $\frac{x}{100+x}\%$

34. $83\frac{1}{3}\%$ of `90 is equal to 60% of ? **(SSC CHSL 2015)**

(a) ` 124 (b) ` 125

(c) ` 123 (d) ` 122

35. In an examination, a student must get 36% marks to pass. A student who gets 190 marks failed by 35 marks. The total marks in that examination is : **(SSC CGL 1st Sit. 2015)**

(a) 500 (b) 625 (c) 810 (d) 450

36. A basket contains 300 mangoes. 75 mangoes were distributed among some students. Find the percentage of mangoes left in the basket **(SSC CGL 1st Sit. 2016)**

(a) 70% (b) 72%

(c) 76% (d) 75%

37. If 35% of A's income is equal to 25% of B's income, then the ratio of A's income to B's income is **(SSC CGL 1st Sit. 2016)**

(a) 7 : 5 (b) 5 : 7 (c) 4 : 7 (d) 4 : 3

38. $6\frac{1}{4}\%$ of $1600 + 12\frac{1}{2}\%$ of 800 equals **(SSC CGL 2nd Sit. 2016)**

(a) 100 (b) 200

(c) 300 (d) 400

39. The price of rice has increased by 60%. In order to restore the original price, the new price must be reduced by **(SSC CGL 2nd Sit. 2016)**

(a) $33\frac{1}{3}\%$ (b) $37\frac{1}{2}\%$

(c) 40% (d) 45%

40. In a motor of 120 machine parts, 5% parts were defective. In another motor of 80 machine parts, 10% parts were defective. For the two motors considered together, the percentage of defective machine parts were **(SSC CGL 2nd Sit. 2016)**

(a) 7 (b) 6.5

(c) 7.5 (d) 8

41. A number is increased by 15% and then decreased by 25% and the number becomes 22 less than the original number. The original number is **(SSC Sub. Ins. 2016)**

(a) 120 (b) 140

(c) 100 (d) 160

42. 32% of a number exceeds 17% of the same number by 120. What is the value of the number? **(SSC CGL 2017)**
(a) 900 (b) 860
(c) 940 (d) 800

43. After deducting 60% from a certain number and then deducting 15% from the remainder, 1428 is left. What was the initial number? **(SSC CGL 2017)**
(a) 4200 (b) 3962
(c) 4150 (d) 4300

44. If A has got 20% more marks than B, then by what percent marks of B are less than the marks of A? **(SSC CGL 2017)**
(a) 16.66 (b) 20
(c) 33.33 (d) 14.28

45. 80 litre mixture of milk and water contains 10% milk. How much milk (in litres) must be added to make water percentage in the mixture as 80%? **(SSC CGL 2017)**
(a) 8 (b) 9
(c) 10 (d) 12

46. A person spends 25% of his annual income on house rent. 15% on education of children and 45% on other items. If he saves ` 14,400 annually, then the person's total income is: **(SSC MTS 2017)**
(a) ` 98,000 (b) ` 1,00,000
(c) ` 96,000 (d) ` 1,20,000

47. The population of a city increases at the rate of 5% per annum. If the present population of the city is 3,70,440. It population 3 years ago was: **(SSC MTS 2017)**
(a) 2,80,000 (b) 3,60,000
(c) 3,20,000 (d) 30,000

48. What will be the net discount (in percentage) after two successive discounts of 40% and 20%? **(SSC Sub. Ins. 2017)**
(a) 60 (b) 68 (c) 52 (d) 42

49. If 40% of a number is 290, then what is the number which is 20% more than the initial number? **(SSC Sub. Ins. 2017)**
(a) 870 (b) 725 (c) 825 (d) 680

50. The price of table depreciates every year by 20%. If the value of the table after 2 years will be ` 32000, then what is the present price (in `) of the table? **(SSC Sub. Ins. 2017)**
(a) 48000 (b) 44000
(c) 50000 (d) 51000

51. The income of A is 24% more than the income of B. By what percent is the income of B less than the income of A? **(SSC Sub. Ins. 2018)**
(a) $\frac{500}{31}\%$ (b) $\frac{600}{29}\%$
(c) $\frac{150}{7}\%$ (d) $\frac{600}{31}\%$

52. In an examination, 48% of candidates passed in science and 56% failed in mathematics. If 32% failed in both subjects, then what percent passed in both subjects? **(SSC Sub. Ins. 2018)**
(a) 28% (b) 24%
(c) 32% (d) 22%

53. In a class of 45 students, 40% are girls and the remaining are boys. The average marks of the girls is 64 and that of the boys is 60. What is the average marks of the whole class? **(SSC Sub. Ins. 2018)**
(a) 61.8 (b) 62.4
(c) 61.6 (d) 62.9

54. The successive discount of 25%, 20% and 10% is equivelant to a single discount of: **(SSC Sub. Ins.2018)**
(a) 44% (b) 46%
(c) 54% (d) 48%

55. The price of sugar is decreased by 10%. By what percent can a person increase the consumption so that there is no change in the expenditure? **(SSC Sub. Ins. 2018)**
(a) 10% (b) $\frac{100}{11}\%$
(c) $\frac{109}{11}\%$ (d) $\frac{100}{9}\%$

56. An article is subject to two successive discounts of 10% and 5% before being sold. If its marked price is ` 800, then its selling price is. **(SSC CHSL 2018)**
(a) ` 722 (b) ` 684
(c) ` 703 (d) ` 680

57. An article is sold for ` 528 after successive discounts of 20% and 12%. What is the marked price of the article? **(SSC CGL 2018)**
(a) ` 760 (b) ` 740
(c) ` 750 (d) ` 780

58. The price of sugar is increased by 20%. A person wants to increase his expenditure by 8% only. By what percent should he decrease his consumption? **(SSC CGL 2018)**
(a) 10% (b) 11%
(c) 9% (d) 12%

59. An article is sold for ` 288 after successive discounts of 25% and $x$%. If the marked price of the article is ` 480, what is the value of x? **(SSC CGL 2018)**
(a) 20 (b) 16
(c) 15 (d) 18

60. The price of sugar is increased by 17%. A person wants to increase his expenditure by 5% only. By approximately what percent should be decrease his consumption? **(SSC CGL 2018)**
(a) 10.3 (b) 10.7
(c) 10.9 (d) 9.9

61. Rahul's salary is 40% less than Rakesh's salary. Deepak's salary is 80% more than Rahul's salary. If Deepak's salary is ` 34560, then what is the salary of Rakesh? **(SSC MTS 2018)**
(a) ` 32000 (b) ` 24000
(c) ` 28000 (d) ` 26000

62. If the length of a rectangle is increased by 40%, and the breadth is decreased by 20%, then the area of the rectangle increases by x%. Then the value of x is : **(SSC CGL 2019-20)**

(a) 16 (b) 8

(c) 20 (d) 12

63. 24% of Reena's salary is equal to 38% of Sunita's salary, Veena's salary in two-third of the total salary of Reena and Sunita. If Veena's salary is ` 62,000, then Sunita's salary is: **(SSC CHSL 2020-21)**

(a) ` 35,000 (b) ` 32,000

(c) ` 36,000 (d) ` 38,000

64. When the price of sugar gets raised by 30%, a person increase his expenditure on sugar only by 12%. By what percentage (correct up to two decimal place) should he reduce his consumption of sugar so as to be able to maintain the same level of expenditure? **(SSC MTS 2020-21)**

(a) 11.54% (b) 12.75% (c) 13.85% (d) 15.75%

65. If decreasing 110 by x % gives tire same result as increasing 50 by x % , then x % of 650 is what percentage more than $(x+20)$ % of 180 ? **(SSC Sub-Inspector 2020-21)**
(correct to nearest integer)

(a) 136% (b) 90% (c) 154% (d) 80%

66. If each side of a rectangle is decreased by 11%, then its area will decrease by: **(SSC Sub-Inspector 2020-21)**

(a) 25% (b) 21.13%(c) 24.31%(d) 20.79%

67. If A's salary is 60% more than B's salary, then by what percentage is B's salary less than that of A? **(SSC Sub-Inspector 2020-21)**

(a) 45% (b) 37.5% (c) 47.7% (d) 33.3%

HINTS & EXPLANATIONS

1. (b) Required precentage $= \frac{50}{100-50} \times 100 = 100\%$

2. (c) Required percentage $= \frac{1.14}{1.9} \times 100 = 60\%$

3. (d) $\frac{A \times 60}{100} = B \times \frac{3}{4}$

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

$\Rightarrow \frac{A}{B} = \frac{3}{4} \times \frac{5}{3} = 5:4$

4. (c) Single equivalent percentage increase in price

$= \left(10 + 10 + \frac{10 \times 10}{100}\right)\% = 21\%$

5. (c) Required percentage

$= \frac{25}{100-25} \times 100 = \frac{100}{3} = 33\frac{1}{3}\%$

6. (c) Let the amount of the bill be ` x.

$\therefore \frac{4x}{100} = 13$

$\Rightarrow x = \frac{1300}{4} = ` 325$

7. (d) $\frac{A \times 90}{100} = \frac{B \times 30}{100}$

$\Rightarrow 3A = B$

$\Rightarrow 3A = A \times \frac{2x}{100}$

$\Rightarrow 300 = 2x \Rightarrow x = 150$

8. (d) $A \times \frac{30}{100} + \frac{B \times 40}{100} = \frac{B \times 80}{100}$

$\Rightarrow A \times 30 = B \times 40$

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

$\Rightarrow \frac{B}{A} \times 100 = \frac{3}{4} \times 100 = 75\%$

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

$\Rightarrow A \times 3 = B$

$\Rightarrow A \times x\% = A \times 3$

$\Rightarrow \frac{x}{100} = 3 \Rightarrow x = 300$

10. (d) Let the third number = 100.

First number = 70

Second number = 63

$\therefore$ Required per cent $= \frac{70-63}{70} \times 100 = 10\%$

11. (d) If the number of females be x, then, number of males $= 15000 - x$

$\therefore x \times \frac{10}{100} + (15000 - x) \times \frac{8}{100} = 16300 - 15000$

$\Rightarrow 10x + 120000 - 8x = 1300 \times 100$

$\Rightarrow 2x = 130000 - 120000 = 10000$

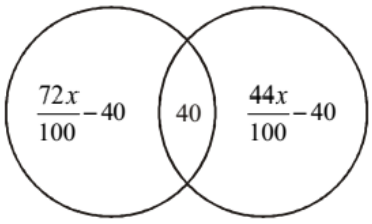
$\Rightarrow x = 5000$

12. (d) Required number $= \frac{80 \times 120}{100} = 96$

13. (a) Required increase $= \left(25 + 12 + \frac{25 \times 12}{100}\right)\% = 40\%$

14. (c) Salary in May 2000 = ` 15000
Salary in July 2000 $\Rightarrow$ 15000 + 10% of 15000 = ` 16500
Salary in October 2001 = 16500 + 10% of 16500 = ` 18150

15. (c) Let the total number of students in the class be x.



$\because \frac{72x}{100}-40+40+\frac{44x}{100}-40=x$

$\Rightarrow \frac{72x}{100}x+\frac{44x}{100}-x=40$

$\Rightarrow \frac{16x}{100}=40 \Rightarrow x=\frac{40\times100}{16}$

$\Rightarrow x=250$

16. (c) Required percentage $=\frac{24}{40}\times100=60\%$

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

$\Rightarrow x=\frac{100\times100}{125}=80$

18. (b) If the number of trees in the garden be x, then

$x\times\frac{60}{100}\times\frac{25}{100}\times\frac{20}{100}=1500$

$\Rightarrow x\times\frac{3}{5}\times\frac{1}{4}\times\frac{1}{5}=1500$

$\Rightarrow x=\frac{1500\times5\times4\times5}{3}=50000$

19. (c) $x=\frac{125}{100}y$ or $\frac{x}{y}=\frac{5}{4}$ or $x:y=5:4$

$y=\frac{75}{100}z$ or $\frac{y}{z}=\frac{3}{4}$ or $y:z=3:4$

x : y : z
5 : 4
3 : 4
15 : 12 : 16

Then, $x: y: z$ is equal to 15: 12: 16

20. (d) Let x be the total number of polled votes.
Then, (57–43)% of x = 42000

$\frac{14}{100}x=42000$

$x=300000$

21. (c) Let the number is x.
According to question
x – 10% of x = 30

$x-\frac{10}{100}x=30$

$\left(\frac{100-10}{100}\right)x=30$

$x=\frac{30\times100}{90}=33\frac{1}{3}$

Hence, the number is $33\frac{1}{3}$

22. (b) Marks of Supriyo = x marks
Accoding to question
Mahuya marks = Supriyo marks – 10% of Supriyo marks

$81=x-10\%\text{ of }x \Rightarrow x\left(1-\frac{10}{100}\right)$

$81=\frac{9}{10}x \Rightarrow \frac{810}{9}=x$

$\therefore x = 90$ marks

23. (a) C = 100

A = 150
B = 125
A is larger than B by

$=\frac{150-125}{125}\times100=20\%$

24. (a) After taking away respective balls,
Number of balls in the box
= 75 + 25 + 50 = 150
$\therefore$ Percentage of black balls

$=\frac{50}{150}\times100=\frac{100}{3}=33\frac{1}{3}\%$

25. (a) Let passing marks be represented by p.
$p\times1.05=273$
$p=260$

Lokesh passing % $=\frac{312-260}{260}\times100=20\%$

26. (b) If boys = x and girls = y, then

$y\times\frac{10}{100}=\frac{x}{20} \Rightarrow \frac{y}{10}=\frac{x}{20}$

$\Rightarrow \frac{x}{y}=\frac{20}{10}=\frac{2}{1}$

27. (d) Sales representative will receive total amount

$\frac{15}{100}\times2800=420$

Remaining amount = 420 – 150 = 270

28. (d) Let the total number of students be x.
Let A and B represent the sets of students who passed in English and Mathematics respectively.

Then, number of students passed in one or both the subjects

$= n(A \cup B) = n(A) + n(B) - n(A \cap B)$

$= 75\%\text{ of } x + 60\%\text{ of } x - (x - 25\%\text{ of } x)$

$= \frac{3}{4}x + \frac{3}{5}x - \frac{3}{4}x = \left(\frac{15+12-15}{20}\right)x = \frac{3}{5}x$

So, $\frac{3}{5}x = 240$

$x = \frac{240 \times 5}{3} = 400$

29. (b) $\frac{40}{100} \times \frac{4}{5} \times \frac{3}{4} \times x = 48$

$\frac{6}{25}x = 48$

$x = \frac{48 \times 25}{6} = 200$

1% of 200 is 2.

30. (a) $\frac{1}{100} \times \frac{1}{100} \times \frac{25}{100} \times 1000 = 0.025$

31. (a) $A \times \frac{15}{100} = B \times \frac{5}{100}$

$\therefore A : B = 1 : 3$

Salary of $A = 40000 \times \frac{1}{4} = 10000$

32. (c) Let original area, height and base of triangle is a, h and b

New area, height and base of triangle is A, H, B

$H = \frac{110}{100}h$

$\Rightarrow H = 1.1\,h$

Original area $(a) = \frac{1}{2} \times b \times h$

New area $(A) = \frac{1}{2} \times B \times H$

$A = \frac{1}{2} \times B \times 1.1h$

But $A = a$

$\therefore \frac{1}{2} \times B \times 1.1h = \frac{1}{2} \times b \times h$

$\frac{B}{b} = \frac{1}{1.1}$

$B = 0.9b$

$\therefore$ Corresponding base must be decreased by

$\frac{1-0.9}{1} \times 100 = 10\%$

33. (b) Cumulative % change $= a + b + \frac{ab}{100}$

Cumulative change to be 0

So $a + b + \frac{ab}{100} = 0$

Here $a = x\%$

So $x + b + \frac{xb}{100} = 0$

$\Rightarrow b\left(1 + \frac{x}{100}\right) = -x$

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

– ve sign means decrease

So we need to decrease the number by $\frac{100x}{100+x}\%$

34. (b) $\frac{250}{3}\%\text{ of } 90 = 90 \times \frac{250}{300}$

$60\%\text{ of } x = \frac{60}{100}x$

So, $90 \times \frac{250}{300} = \frac{60}{100}x$

$x = \frac{90 \times 250 \times 100}{300 \times 60}$

$x = \frac{3 \times 250}{3 \times 2} = 125.$

35. (b) Let total mark of Examination be x.

$\Rightarrow x \times \frac{36}{100} = 190 + 35$

$\Rightarrow \frac{x \times 36}{100} = 225$

$x = 625$

36. (d) Total mango = 300

Distribution = 75

Distributed $\% = \frac{75}{300} \times 100 = 25\%$

Percentage of mangoes left in the basket = 75%

37. (b) 35 % A's Salary = 25% of B's Salary

$\frac{35}{100}A = \frac{25}{100}B$

$\frac{A}{B} = \frac{5}{7}$ or 5 : 7

38. (b) $6\frac{1}{4}\%\text{ of } 1600 + 12\frac{1}{2}\%\text{ of } 800$

$\frac{25}{400} \times 1600 + \frac{25}{200} \times 800 = 200$

39. (b) By using $x + y + \frac{xy}{100} = 0$

Let Price be reduced by = x%

$$60 + x + \frac{60x}{100} = 0$$

$$\frac{160x}{100} = -60$$

$$x = -\frac{6000}{160} = -37\frac{1}{2} \text{ (– shows reduction)}$$

40. (a) Total deffective part $= \frac{5}{100} \times 120 + \frac{10}{100} \times 80 = 6 + 8 = 14$

$$\text{Deffective \%} = \frac{14}{200} \times 100 = 7\%$$

41. (d) Let the number be 100
Number increased by 15% = 115
Number decreased by 25%

$$= 115 - \frac{25}{100} \text{ of } 115 = 86.25$$

According to question,
$(100 - 86.25)$ unit $\rightarrow 22$

$$1 \text{ unit} \rightarrow \frac{22}{13.75}$$

$$100 \text{ units} = \frac{22}{13.75} \times 100 = 160$$

Hence, original number is 160.

42. (d) Required number $\Rightarrow \frac{x \times 32}{100} - \frac{x \times 17}{100} = 120$

$$\Rightarrow \frac{32x - 17x}{100} = 120$$

$$\Rightarrow \frac{15x}{100} = 120$$

$$\therefore \quad x = \frac{120 \times 100}{15} = 800$$

43. (a) Let initial number be x.
According to question,

$$x \times \frac{40}{100} \times \frac{85}{100} = 1428$$

$$\therefore \quad x = \frac{1428 \times 100 \times 100}{40 \times 85} = 4200.$$

44. (a) Required percent of marks $= \frac{20 \times 100}{120}$

$= 16.66\%$

45. (c) According to question,

$$\text{Volume of water} = 80 \times \frac{90}{100} = 72 \text{ litres}$$

$$\text{Volume of milk} = 80 \times \frac{10}{100} = 8 \text{ litres}$$

Now,

$$\frac{8 + x}{72} = \frac{20}{80}$$

$$\Rightarrow \quad 640 + 80x = 1440$$

$$\therefore \quad x = \frac{(1440 - 640)}{80} = 10 \text{ litres}.$$

46. (c) Total spend of his annual income
$= (15\% + 25\% + 45\%) = 85\%$
$\therefore$ Saves $= (100 - 85)\% = 15\%$
$\therefore$ 15% of annual income = 14400

$$\therefore \quad 100\% \text{ annual income} = \frac{14400}{15} \times 100 = 96,000$$

$\therefore$ Total income = ` 96,000

47. (c) Present population = 370440
Rate = 5%
Time = 3 years
According to question,

$$370440 = x\left(1 + \frac{5}{100}\right)^3$$

$$370440 = x \times \left(\frac{21}{20}\right)^3$$

$$\therefore \quad x = \frac{370440 \times 20 \times 20 \times 20}{21 \times 21 \times 21}$$

$= 320,000$
$\therefore$ Population of city 3 years was = 320000.

48. (c) Required net discount $= \left(40 + 20 - \frac{(40 \times 20)}{100}\right)\%$

$= (60 - 8)\% = 52\%$

49. (a) Let original number = x
According to question,

$$\frac{x \times 40}{100} = 290$$

$$\therefore \quad x = \frac{290 \times 100}{40} = 725$$

$$\therefore \quad \text{Required number} = \frac{725 \times 120}{100} = 870$$

50. (c) Present price of table $= \frac{32000}{\left(1 - \frac{20}{100}\right)^2}$

$$= 32000 \times \frac{5}{4} \times \frac{5}{4} = 50000$$

51. (d) Let income of B is ` 100.

$$\text{then income in A} = 100 + 100 \times \frac{24}{100} = 100 + 24$$

$= 124.$
Difference on income $= 124 - 100 = 24.$
Percentage difference in income of B w.r.t. A

$$= \frac{24}{124} \times 100 = \frac{600}{31}\%$$

52. (b) Percent of students passed in mathematics.
$= 100 - 56 = 44\%$
Number of students passed in either science or math
$= 100 - 32 = 68\%$

Number of students passed in both subjects.
$n(A \cap B) = n(A) + n(B) - n(A \cup B)$
$= 48\% + 44\% - 68\%$
$= 24\%$

53. (c) Number of girls in the class

$= 45 \times \frac{40}{100} = 18$

Number of boys in the class $= 45 - 18 = 27$
Total marks of girls $= 18 \times 64 = 1152$
Total marks of boys $= 27 \times 60 = 1620$
Total marks of the class $= 1152 + 1620 = 2772$

Average marks of the class $= \frac{2772}{45} = 61.6$

54. (b) Amount after first discount $= 100 \times \left(\frac{100-25}{100}\right) = 75\%$

Amount after second discount $= 75 \times \left(\frac{100-20}{100}\right) = 60\%$

Amount after third discount $= 60 \times \left(\frac{100-10}{100}\right) = 54\%$

$\therefore$ Equivalent discount $= 100 - 54 = 46\%$

55. (d) Let price of 1 kg sugar is ` 100.

After decrease price of 1 kg sugar

$= 100 \times \left(\frac{100-10}{100}\right) = 90$

Now, amount of sugar purchased in ` 100

$= \frac{1}{90} \times 100 = \frac{10}{9}$ kg

Percentage increase in consumption

$= \left(\frac{\frac{10}{9}-1}{1}\right) \times 100 = \frac{100}{9}\%$

56. (b) Selling price

$= 800 \times \left(\frac{100-10}{100}\right) \times \left(\frac{100-5}{100}\right)$

$= 800 \times \frac{90}{100} \times \frac{95}{100} = ` 684$

57. (c) Marked price $=$ Selling Price $\times \frac{100}{(100 - \text{discount}\%)}$

$= 528 \times \frac{100}{(100-20)} \times \frac{100}{(100-12)}$

$= 528 \times \frac{100}{80} \times \frac{100}{88} = ` 750$

58. (a) Let the original price of Sugar was ` 100/kg.

After increase, price of 1 kg Sugar = ` 120

Expenditure increases by 8%

So, new expenditure $= 100 + 8 =$ ` 108

Now, amount of Sugar bought in ` 108

$= \frac{1000}{120} \times 108 = 900$ gram

Percent deduction in consumption

$= \frac{1000-900}{1000} \times 100 = 10\%$

59. (a) Marked price $=$ selling price $\times \frac{100}{100 - (\text{discount}\%)}$

$480 \times \frac{(100-25)}{100} \times \frac{(x)}{100} = 288$

$(x) = \frac{288 \times 100 \times 100}{480 \times 75} = 20\%$

60. (a) Let intial price of sugar was ` 100/kg
After increase price for 1kg sugar = ` 117
Increased Expenditure = ` 105
consumption

$= \frac{1000}{117} \times 105 = 897.43$ gram

$\therefore$ Decrease in consumption

$= \frac{1000-897.43}{1000} \times 100 = 10.3\%$

61. (a) Let the salary of Rakesh be 100 unit
We have given Rahul's salary is 40%
Less than Rakesh's salary and Deepak's salary is 80% more than Rahul's salary.
So the ratio of the salaries are

Rakesh	Deepak	Rahul
100	108	60
(80% more than Rahul's	(40% less than Rakesh	
$\frac{60 \times 80}{100} = 48$	$100 - 40 = 60$	
$60 + 48 = 108$)		

Ratio's of salaries

Rakesh	Deepak	Rahul
100 108	60	
25 :	27 :	15

we have Deepak's salary = ` 34560
27 unit $\rightarrow$ ` 34560
1 unit $\rightarrow$ ` 1280
Hence the salary of Rakesh is
$= 1280 \times 25 =$ ` 32000

62. (d) When length of rectangle is increased by 40% and the breadth is decreased by 20%.

Required percentage increased by

$= 40 - 20 - \frac{40 \times 20}{100}$

$= 40 - 20 - 8 \Rightarrow 40 - 28 = 12\%$

63. (c) Given, Veena's salary = ` 62,000

According to question,

$\text{Veena's salary} = \frac{2}{3} \times (\text{Reena's salary} + \text{Sunita's salary})$

$\Rightarrow$ Reena's salary + Sunita's salary

$= 62{,}000 \times \frac{3}{2} =$ ` 93,000 ... (i)

24% of Reena's salary = 38% Sunita's salary

$\Rightarrow \text{Reena's salary} = \frac{38}{24} \times \text{Sunita's salary}$ ...(ii)

By putting equation (ii)'s value in equation (i),

$\Rightarrow \frac{38}{24} \times \text{Sunita's salary} + \text{Sunita's salary} =$ ` 93000

$\Rightarrow \frac{62}{24} \times \text{Sunita's salary} =$ ` 93000

Hence, Sunita's salary $= 93000 \times \frac{24}{62} =$ ` 36000

64. (c) Let the initial price of sugar = ` 10

After 30% increase the price of Sugar

$= \frac{10 \times 130}{100} =$ ` 13

Let, initial expenditure on Sugar = ` 10

After, 20% increase the expenditure on Sugar

$= \frac{10 \times 112}{100} =$ ` 11.2

To maintain the same level of expenditure, reduction

in the consumpetion $= \frac{(13 - 11.2)}{13} \times 100$

$= \frac{1.8}{13} \times 100 = 13.85\%$

65. (a) $110 \times \frac{(100 - x)}{100} = 50 \times \frac{(100 + x)}{100}$

$16x = 600$

$x = 37.5$

$37.5\% \times 650 = 243.75$

$57.5 \times 780 = 103.5$

$\frac{140.25}{103.5} \times 100 = 136\%$

66. (d) Successive decrease $= -11 - 11 + \frac{11 \times 11}{100} = -20.79\%$

67. (b) $A = \frac{160}{100} B$

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

$\Rightarrow \frac{8 - 5}{8} \times 100 = \frac{300}{8} = 37.5\%$

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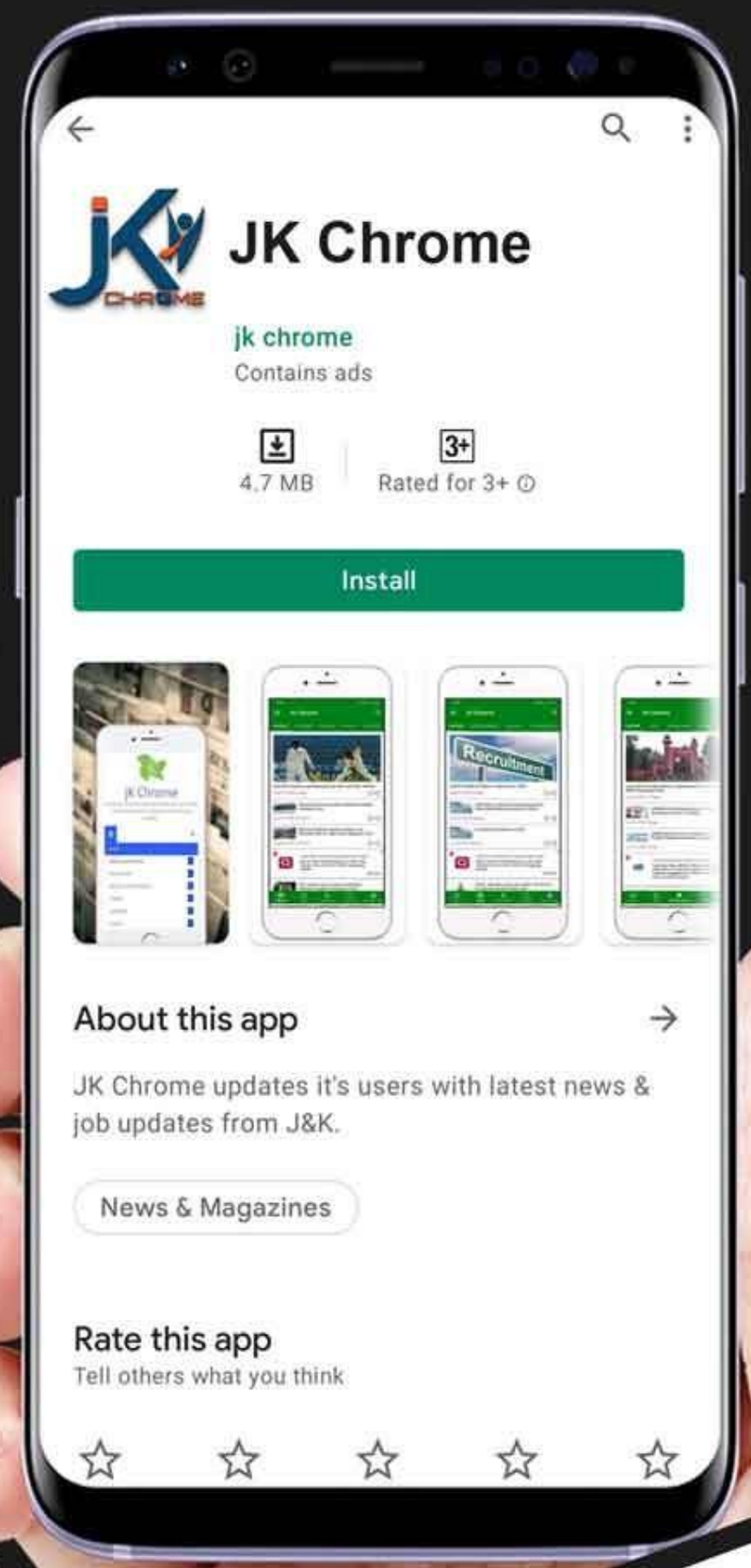

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