Chapter - 6

Percentage

Foundation

Solution

1. (d); 3.5 can be expressed as (3.5 × 100)% = 350%

2. (d); $\frac{15}{100}\times 34 = 5.10$ Rs.

3. (b); $\frac{88}{100}\times 370+\frac{24}{100}\times 210-x = 118$

   x = 325.6 + 50.4 - 118 = 376 - 118 = 258

4. (c); $\frac{860}{100}\times 50+\frac{50}{100}\times 860 = \frac{860}{100}(50+50) = 860$

5. (b); $\frac{60}{100}\times 264 = 158.40 \Rightarrow \frac{15}{100}\times 1056 = 158.40$

6. (d); Passing percentage = $\frac{252}{270}\times 100 = 93\frac{1}{3}\%$

7. (b); Required percentage = $\frac{1987.50}{2650}\times 100 = 75\%$

8. (a); Percentage = $\frac{3}{24}\times 100 = 12\frac{1}{2}\%$

9. (c); Litres of pure acid = $\frac{20}{100}\times 8 = 1.6$ litres

10. (b); Best percentage = $\frac{425}{500}$

11. (b); $\frac{15}{100\times 100}\times\frac{100}{300}\times 10000 =$ Rs. 5

12. (c); $\frac{45}{100}\times 1500+\frac{35}{100}\times 1700 = \frac{x}{100}\times 3175$

    $\Rightarrow x = \frac{1270\times 100}{3175} = 40$

13. (b); Let the worth of cloth be x

    $x\times\frac{2.5}{100} = 12.50 \Rightarrow x = \frac{12500}{25} \Rightarrow x = 500$ Rs.

14. (b); Worth of the house = $2800\times\frac{7}{2} = 9800$ Rs.

15. (c); 35% is = 175 $\Rightarrow$ 100% = $\frac{175}{35}\times 100 = 500$

    Required percentage = $\frac{500}{175}\times 100 = 285.71\%$

16. (d); Let the number is x

    $\frac{50}{100}x-\frac{35}{100}x = 12 \Rightarrow \frac{15x}{100} = 12$

    $x = \frac{12\times 100}{15} \Rightarrow x = 80$

17. (c); Total such numbers = 14

    Required percentage = $\frac{14}{70}\times 100 = 20\%$

18. (c); Let the number be x.

    $\frac{75}{100}x+75 = x \Rightarrow x-\frac{3}{4}x = 75$

    $\frac{x}{4} = 75 \Rightarrow x = 300$

19. (d); Let the two numbers be x and y.

    $x + y = 2490 \Rightarrow \frac{65}{1000}x = \frac{85}{1000}y$

    $x = \frac{17}{13}y \Rightarrow \frac{17}{13}y + y = 2490$

    $\frac{30y}{13} = 2490 \Rightarrow y = \frac{2490\times 13}{30}$

    $y = 1079 \Rightarrow x = 2490 - 1079 \Rightarrow x = 1411$

20. (b); Let the First and Second number be x and y

    $\frac{x}{12} = \frac{y}{4} \Rightarrow \frac{x}{y} = \frac{3}{1}$

    Required percentage = $\frac{3-1}{1}\times 100 = 200\%$

21. (c); Let the Numbers be x and y.

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

    $\frac{x}{y} = \frac{5}{4}$ $\quad\begin{bmatrix} x = 5k \\ y = 4k \end{bmatrix}$

    $x^2 + y^2 = 656 \Rightarrow 25k^2 + 16k^2 = 656$

    $k^2 = \frac{656}{41} \Rightarrow k = 4 \Rightarrow x = 4\times 5 = 20$

    $y = 4\times 4 = 16$

    Numbers are 16 and 20

22. (d); Percentage increase in salary = $\frac{900}{7200}\times 100$

    $= \frac{100}{8} = 12\frac{1}{2}\%$

23. (d); Let B's salary be = 100, A's salary be = 80

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

24. (a); Let the price of petrol be 100
Increase Price = 120

$$\text{Required percentage} = \frac{120-100}{120}\times 100$$

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

25. (b); $\text{Increased Price} = \frac{110}{100}\times\frac{110}{100}\times 100 = 121$

Required value = 121 – 100 = 21

26. (a); $\text{Commission} = 15000\times\frac{25}{200} = \frac{15000}{8} = 1875$ Rs.

27. (d); $\text{Increase Monthly income} = 5000\times\frac{130}{100} = 6500$ Rs.

28. (b); $\text{New Price of the article} = 15000\times\frac{92}{100}$

= 13800 Rs.

29. (d); Money left = 100% - 20% - [100% - 20%] $\frac{25}{100}$

= 100% – 20% – 20% = 60%

$$\therefore \quad 60\% = 480 \quad \Rightarrow \quad 100\% = \frac{480}{60}\times 100 = \text{Rs. } 800$$

30. (d); $\frac{15}{100}\times\frac{10}{100}\times\frac{20}{100}\times 1000 = 3$

31. (b); Let the number will be $\frac{x}{y}$

$$\text{Increased number} = \frac{x+\frac{120}{100}x}{y+\frac{350}{100}y} = \frac{11}{27} \quad \Rightarrow \quad \frac{\frac{220x}{100}}{\frac{450y}{100}}$$

$$\Rightarrow \frac{x}{y} = \frac{11}{27}\times\frac{45}{22}$$

Original Fraction $\Rightarrow \frac{x}{y} = \frac{5}{6}$

32. (c); Let the Numbers be x and y.

$$\frac{40}{100}x = \frac{2}{3}y \quad \Rightarrow \quad \frac{2}{5}x = \frac{2}{3}y$$

$$\frac{x}{y} = \frac{5}{3} \quad \Rightarrow \quad x : y = 5 : 3$$

33. (b); Run scores from boundaries and sixes
= 3 × 4 + 8 × 6 = 60
Required pecentage by Running between the wickets = $\frac{110-60}{110}\times 100 = \frac{500}{11} = 45\frac{5}{11}\%$

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

$$5x - 5y = 3x + 3y \quad \Rightarrow \quad 2x = 8y \quad \Rightarrow \quad \frac{y}{x} = \frac{1}{4}$$

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

35. (b); Error = (81.5 - 81.472) = 0.028

Required percentage = $\frac{0.028}{81.472}\times 100 = 0.034\%$

36. (b); Let the number be x and y

$$x - y = 1600 \quad \Rightarrow \quad \frac{75}{1000}x = \frac{125}{1000}y$$

$$x = \frac{5}{3}y \quad \Rightarrow \quad \frac{5}{3}y - y = 1600$$

$$\frac{2y}{3} = 1600 \quad \Rightarrow \quad y = 2400$$

x = 1600 + 2400 = 4000

37. (c); Let the number be x

$$\frac{65}{100}x + 21 = \frac{4}{5}x \quad \Rightarrow \quad \frac{4x}{5} - \frac{13x}{20} = 21$$

$$\frac{16x-13x}{20} = 21 \quad \Rightarrow \quad \frac{3x}{20} = 21 \quad \Rightarrow \quad x = 140$$

38. (c); It means that 0.08% of x = 2

$$\frac{8}{100\times 100}\times x = 2 \quad \Rightarrow \quad x = \frac{2\times 100\times 100}{8}$$

Required Number = 2500

39. (d); Greatest Number = 0.17

40. (c); $16\frac{2}{3}\times\frac{1}{100}\times 600 - 33\frac{1}{3}\times\frac{1}{100}\times 180$

$$\Rightarrow \quad \frac{1}{6}\times 600 - \frac{1}{3}\times 180 = 100 - 60 = 40 \text{ gm}$$

Moderate

1. (b); If Rishu failed by 5% marks which means he got 30% marks.

30% marks $= 216 \Rightarrow 100\%$ marks $= \frac{216}{30} \times 100$

Total marks = 720

2. (d); If the price of petrol has increase by 20%, it has gone up $\frac{1}{5}$th of its earlier price.

$\therefore$ The percentage of reduction in petrol that will maintain the amount of money spent on petrol

$= \frac{1}{1+5} = \frac{1}{6}$

$= 16.67\% \Rightarrow$ Reduction in travel = 16.67%

3. (a); Let the increased breath be x

$20 + x + \frac{20x}{100} = 50$ $\left[\%\text{ increase} = m + n + \frac{mn}{100}\right]$

$x + \frac{x}{5} = 30 \Rightarrow \frac{6x}{5} = 30$

$x = \frac{30 \times 5}{6} \Rightarrow x = 25\%$

4. (b); Let amit's salary be x

Aditya salary $= \frac{120}{100} \times 30,000 = 36,000$ Rs.

$\frac{x \times 80}{100} = 36000 \Rightarrow x = \frac{36000 \times 100}{80} = 45,000$ Rs.

5. (b); The percentage of students fails in both subjects = 100 - [(60 + 45) - 25] = 20%

6. (c); Required quantity of arc $= 69 \times \frac{100}{23} = 300$

7. (b); Percentage consumption Reduced $= \frac{4}{30} \times 100$

$= \frac{40}{3} = 13\frac{1}{3}\%$

8. (c); Let Aditya's a salary was 100 Rs.
Increased salary = 140 Rs.

Decreased salary $= 140 \times \frac{75}{100} = 105$ Rs.

Net effect = 105 –100 = 5% increase

9. (c); Student of 8 years = 48
Total number of Students of age more than 8 years

$= 48 \times \frac{2}{3} = 32$

Total student 8 years old or above = 32 + 48 = 80
Now 20% of students of is below 8 years old, so 80% of student = 80
So total student = 100

10. (d); Let number is 15

Original result $= 15 \times \frac{5}{3} = 25$

Wrong result $= 15 \times \frac{3}{5} = 9$

Percentage error $= \frac{25-9}{25} \times 100 = 64\%$

11. (a); No of valid votes $= 7500 \times \frac{80}{100} = 6000$

No. of votes that other candidate got $= 6000 \times \frac{45}{100}$

$= 2700$

12. (a); Total no of votes = 1136 + 7636 + 11628 = 20400

required percentage $= \frac{11628}{20400} \times 100 = 57\%$

13. (a); Rebate $= 6650 \times \frac{6}{100} = 399$ Rs.

Amount after Rebate = 6650 – 399 = Rs. 6251

Amount paid for the goods $= 6251 \times \frac{110}{100}$

$= 6876.10$ Rs.

14. (b); Percentage increase in decade $= \frac{87500}{175000} \times 100$

$= 50\%$

$\therefore$ 50% increase in 10 years.
$\therefore$ Per years % increase = 5%

15. (d); Passing percentage = 46% – 15% = 31%

$\therefore$ $6\% = 45 \Rightarrow 100\% = \frac{45}{6} \times 100$

$\therefore$ Total marks = 750

16. (b); Let the initial amount be 100%
Total amount stolen and gave to friend = 35%
Remaining amount = 65%

Amount spend on party $= \frac{65}{2} = 32.5\%$

32.5% = 26

$100\% = \frac{26}{32.5} \times 100 \Rightarrow$ Initial amount = Rs. 80

17. (c); Let B's salary be 100, A's salary be 120

Required pecentage $= \frac{20}{120} \times 100 = \frac{100}{6} = 16.67\%$

18. (d); Let the number be 100, Increased number = 120

Decreased number = $120 \times \frac{80}{100} = 96$

After this number is decreased by 4%.

19. (d); Let the number be x

$\therefore \quad \frac{3}{5}x = 23 + \frac{50x}{100} \Rightarrow \frac{3}{5}x - \frac{1}{2}x = 23 \Rightarrow x = 230$

$= \frac{80}{100} \times 230 = 184$

20. (a); Let the third number be 100
Second number = 70, First number = 80

Required percentage = $\frac{70}{80} \times 100 = 87.5\%$

21. (c); Let the two number be x and y

$x + y = \frac{23}{20}$ of $x \Rightarrow y = \frac{23x}{20} - x \Rightarrow y = \frac{3x}{20}$

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

22. (b); Let the Number = 7
So, correct answer = 7 × 7 = 49

But answer obtained = $\frac{7}{7} = 1$

% error = $\frac{48}{49} \times 100 = 97.96\%$

23. (d); Let the total number of children be x then

$\frac{405}{x} = x \times \frac{20}{100} \Rightarrow \frac{405}{x} = \frac{x}{5} \Rightarrow x^2 = 2025$

$x = 45$

$\therefore$ number of toffies each students get = $\frac{405}{45} = 9$

24. (a); 10% marks = 35 + 15 = 50, 100 % marks = 50 × 10
$\therefore$ Total marks = 500

Passing marks = $500 \times \frac{30}{100} + 15 = 165$

Required percentage = $\frac{165}{500} \times 100 = 33\%$

25. (b); Let the price per kg is 100 rs.
The total money used for 49 kg = 4900 Rs.

After Price decrease = $\frac{4900}{98} = 50$kg

Means 1 kg is the answer.

26. (d); Let Ram's salary is 100
Sanjay's salary is 80 and Aditya's salary is 125
Total of all salary = 305

$\therefore$ Sanjay's salary = $\frac{61000}{305} \times 80$ = 16000 Rs.

27. (c); let B = 100, then A = 150

Required pecentage = $\frac{100}{250} \times 100 = 40\%$

28. (d); Required percentage = 20 + 25 – 7 = 38%

29. (d); percentage of students passed in both the subjects = 100 –(30 + 45 – 25) = 50%

30. (a); Population x years ago = $\frac{A}{\left[1 + \frac{r}{100}\right]^n}$

$= \frac{1331000}{\left[1 + \frac{10}{100}\right]^3} = \frac{1331000}{\frac{1331}{1000}} = 1000000$

31. (c); Let C received = 100
$\therefore$ B received = 120

A received = $120 \times \frac{125}{100} = 150$

Amount A received = $\frac{18500}{370} \times 150$ = Rs. 7500

32. (d); Let the price of a shirt be 100
25% increase = 125

30 % decrease = $125 \times \frac{70}{100} = 87.5\%$

$\therefore$ % decrease = 100 – 87.5 = 12.5%

33. (d); Marks of Aditya = 456 – 24 = 432
$\therefore$ 54% = 432

100% = $\frac{432}{54} \times 100 = 800$

Passing marks = $800 \times \frac{35}{100} = 280$

Required marks = 456 – 280 = 176

34. (b); Total no of boy and girl appered in the examination = 1200 + 650 = 1850

No. of boy passed = $1200 \times \frac{30}{100} = 360$

No. of girl passed = $650 \times \frac{60}{100} = 390$

Total no. of boys and girl passed = 750

Required % = $\frac{750}{1850} \times 100 = 40.54\% \cong 41\%$

35. (c); Sanjay's monthly salary = $\frac{17250}{115} \times 100$

= Rs. 15000

Sanjay's Annual salary = 15000 × 12

= Rs. 180000

36. (c); Population at the end of 2 years.

$55000 \times \frac{112}{100} \times \frac{85}{100} = 52360$

37. (d); Impact on area

$= 20 + (-10) + \frac{20 \times (-10)}{100}$ $\left[\text{Using formula } m + n + \frac{mn}{100}\right]$

= 10 – 2 = 8% increased

38. (a); Can't be determined since impact on perimeter can't be determined as changes in different length and breadth give different net effect on perimeter.

39. (c); Let Sanjay gets 100 marks

∴ Girish gets 120 marks

∴ Ram gets = $120 \times \frac{120}{100} = 144$ marks

Sanjay marks = $\frac{576}{144} \times 100 = 400$

Aditya marks = $\frac{400 \times 100}{80} = 500$ marks

40. (d); Let the numbers be x and y

So product = xy

given, $\frac{1}{3}x \times \frac{150y}{100} \Rightarrow \frac{1}{3}x \times \frac{3y}{2} \Rightarrow \frac{xy}{2}$

Required percentage = $\frac{\frac{xy}{2}}{xy} \times 100$

= 50%

Percentage Quick Maths Formulas

→ The population of a town is P. It increases by x% during the 1st year, increases by y% during the 2nd year and again increases by z% during the third year. Then, the population after 3 years will be -

P*(100+x)(100+y)(100+z) / 100*100*100

→ When the population decreases by y% during the 2nd year, while for the 1st and 3rd years, it follows the same, the population after 3 years will be –

P*100+x)(100-y)(100+z) / 100*100*100

→ If the price of a commodity increases by r%, then the reduction in consumption so as not to increase the expenditure, is (r/100+r) * 100%

→ If the price of a commodity decreases by r%, then the increase in consumption so as not to decrease the expenditure, is (r/100-r) * 100%

Scan here to get the full SSC CGL Tier 1 Maths Short Tricks & Formulas PDF.

Scan me!