PERCENTAGE

SYNOPSIS

The word 'per cent' means 'per hundred' or 'out of hundred'. We abbreviate per cent by p.c. and denote it by the symbol %.

Thus, 5 per cent is written as 5%

Hundredth Part : Out of 100 equal parts, each part is known as its hundredth part.

Thus, $\frac{7}{100} = 7$ hundredths, $\frac{13}{100} = 13$ hundredths and so on.

Percentage

By a certain percentage, we mean that many hundredths.

Thus, x% = x hundredths = $\frac{x}{100}$

$\therefore 9\% = \frac{9}{100}, 15\% = \frac{15}{100}, 83\% = \frac{83}{100}$, etc.

Rule 1: To express a fraction as a per cent, multiply it by 100.

Example 1: Express each of the follwing as per cent:

(i) $\frac{3}{8}$ (ii) $1\frac{1}{16}$

Sol. We have (i) $\frac{3}{8} = \left(\frac{3}{8} \times 100\right)\% = \left(\frac{75}{2}\right)\% = 37.5\%$

(ii) $1\frac{1}{16} = \left(\frac{17}{16} \times 100\right)\% = \left(\frac{425}{4}\right)\% = 106.25\%$

Rule 2: To convert a percentage into a fraction, we divide it by 100 and remove the % sign.

Example 2: Express each of the following as a fraction

(i) 12% (ii) 7.5%

Sol. We have

(i) $12\% = \frac{12}{100} = \frac{3}{25}$

(ii) $7.5 = \left(\frac{7.5}{100}\right) = \left(\frac{75}{1000}\right) = \frac{3}{40}$

Percentage as A Ratio

A percentage can be expressed as a ratio with its second term 100 and first term equal to the given percentage.

Example 3: Express each of the following as a ratio:

(i) 19% (ii) 12.5%

Sol. We have (i) $19\% = \frac{19}{100} = 19:100$

(ii) $12.5\% = \frac{12.5}{100} = \frac{125}{1000} = \frac{1}{8} = 1:8$

Rule 3: To express a given ratio as per cent, convert the given ratio into a fraction, and then multiply the fraction by 100.

Example 4: Expression each of the following ratios as a per cent:

(i) 16:25 (ii) 108:125

Sol. We have (i) $16:25 = \frac{16}{25} = \left(\frac{16}{25} \times 100\right)\% = 64\%$

(ii) $108:125 = \frac{108}{125} = \left(\frac{108}{125} \times 100\right)\% = \left(\frac{432}{5}\right)\% = 86.4\%$

Rule 4: To express a given percentage as a decimal, divide it by 100 and then convert it into decimal form.

Example 5: Express each of the following decimal:

(i) 64% (ii) 0.35%

Sol. We have (i) $64\% = \frac{64}{100} = 0.64$

(ii) $0.35\% = \frac{0.35}{100} = \frac{35}{10000} = 0.0035$.

Rule 5: To express a given decimal as per cent, multiply it by 100.

Example 6: Express each of the following as a per cent:

(i) 0.6 (ii) 0.004

Sol. We have (i) $0.6 = (0.6 \times 100)\% = 60\%$

(ii) $0.004 = (0.004 \times 100)\% = 0.4\%$.

Rule 6: To find a certain percentage of a given quantity, convert the percentage into a fraction and multiply the given quantity with the resulting fraction.

Example 7: Find (i) 15% of Rs. 80 (ii) 4% of 1 hour 15 min

Sol. We have (i) 15% of Rs. 80 $= \frac{15}{100}$ of Rs. 80 = Rs. $\left(80 \times \frac{15}{100}\right)$ = Rs. 12.

(ii) 4% of 1 hour 15 minutes = $\frac{4}{100}$ of 75 min. = $\left(75 \times \frac{4}{100}\right)$ min = 3 min.

PERCENAGE CHANGE

(i) $\text{Decrease \%} = \left(\frac{\text{Decrease in value}}{\text{Original value}} \times 100\right)\%$

(ii) $\text{Increase \%} = \left(\frac{\text{Increase in value}}{\text{Original value}} \times 100\right)\%$

Example 8: Increase 90 by 20%

Sol. $\text{Increase} = 20\% \text{ of } 90 = \frac{20}{90} \text{ of } 90 = \left(90 \times \frac{20}{100}\right) = 18$

$\therefore$ Increased value $= (90 + 18) = 108$

Example 9: Decrease 60 by 25%.

Sol. $\text{Decrease} = 25\% \text{ of } 60 = \frac{25}{100} \text{ of } 60 = \left(60 \times \frac{25}{100}\right) = 15$.

$\therefore$ Decreased value = (60 - 15) = 45.

WORK SHEET

SINGLE ANSWER TYPE

1. The ratio $5:4$ expressed as a percent equals
   1) 12.5% 2) 40% 3) 80% 4) 125%
2. 3.5 can be expressed in terms of percentage as
   1) 0.35% 2) 3.5% 3) 35% 4) 350%
3. $63\% \text{ of } 3\frac{4}{7}$ is
   1) 2.25 2) 2.40 3) 2.50 4) 2.75
4. $860\% \text{ of } 50 + 50\% \text{ of } 860 = ?$
   1) 430 2) 516 3) 860 4) 960
5. 45% of 750 - 25% of 480 = ?
   1) 216 2) 217.50 3) 236.50 4) 245
6. 270 candidates appeared for an examination, of which 252 passed. The pass percentage is
   1) 80% 2) $83\frac{1}{2}\%$ 3) $90\frac{1}{3}\%$ 4) $93\frac{1}{3}\%$
7. 5 out of 2250 parts of earth is sulphur. What is the percentage of sulphur in earth?
   1) $\frac{11}{50}$ 2) $\frac{2}{9}$ 3) $\frac{1}{45}$ 4) $\frac{2}{45}$
8. 0.01 is what percent of 0.1?
   1) $\frac{1}{100}$ 2) $\frac{1}{10}$ 3) 10 4) 100

9. What percent of a day is 3 hours?

1) $12\frac{1}{2}\%$ 2) $16\frac{2}{3}\%$ 3) $18\frac{2}{3}\%$ 4) $22\frac{1}{2}\%$

10. Rajeev buys goods worth Rs. 6650. He gets a rebate of 6% on it. After getting the rebate, he pays sales tax % 10%. Find the amount he will have to pay for the goods.

1) Rs. 6876.10 2) Rs. 6999.20 3) Rs. 6654 4) Rs. 7000

11. Which one of the following shows the best percentage?

1) $\frac{384}{540}$ 2) $\frac{425}{500}$ 3) $\frac{570}{700}$ 4) $\frac{480}{660}$

12. 0.15% of $33\frac{1}{3}\%$ of Rs. 10,000 is

1) Re. 0.05 2) Rs. 5 3) Rs. 105 4) Rs. 150

13. What is 25% of 25% equal to

1) 0.00625 2) 0.0625 3) 0.625 4) 6.25

14. If Rs. 2800 is $\frac{2}{7}$ percent of the value of a house, the worth of the house (in Rs.) is

1) 8,00,000 2) 9,80,000 3) 10,00,000 4) 12,00,000

15. If 120 is 20% of a number, then 120% of that number will be

1) 20 2) 120 3) 360 4) 720

16. If 35% of a number is 175, then what percent of 175 is that number?

1) 35% 2) 65% 3) 280% 4) None of these

17. Two-fifth of one-third of three-seventh of a number is 15. What is 40 percent of that number?

1) 72 2) 84 3) 136 4) None of these

18. The difference between a number and its two-fifth is 510. What is 10% of that number?

1) 12.75 2) 85 3) 204 4) None of these

19. If 35% of a number is 12 less than 50% of that number, then the number is

1) 40 2) 50 3) 60 4) 80

20. If 75% of a number is added to 75, then the result is the number itself. The number is

1) 50 2) 60 3) 300 4) 400

21. A number, when 35 is subtracted from it, reduces to its 80 percent. What is fourth-fifth of that number?

1) 70 2) 90 3) 120 4) 140

22. The sum of two numbers is $\frac{28}{25}$ of the first number. The second number is what percent of the first?

1) 12% 2) 14% 3) 16% 4) 18%

23. If 25% of a number is subtracted from a second number, the second number reduces to its five-sixth. What is the ratio of the first number to the second number?

1) 1:3 2) 2:3 3) 3:2 4) Data inadequate

24. The difference of two numbers is 20% of the larger number. If the smaller number is 20, then the larger number is

1) 25 2) 45 3) 50 4) 80

25. Two numbers A and B are such that the sum of 5% of A and 4% of B is two-third of the sum of 6% of A and 8% of B. Find the ratio of A:B.
1) 2:3 2) 1:1 3) 3:4 4) 4:3

26. A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. What is the percentage error in the calculation?
1) 34% 2) 44% 3) 54% 4) 64%

WORK SHEET - 2

SINGLE ANSWER TYPE

1. Sowjanya obtained 60 marks out of 75 mathematics. Find the percentage of marks got by her.

1) 80% 2) 81% 3) 82% 4) 83%

2. What percent of the first quantity in the second quantity in the following. 18 dozens, 6 dozens.

1) 33.33 2) 33.75 3) 33.89 4) 33.95

3. In an alloy the ratio of Copper, Zinc and Nickel is 26 : 13 : 11. Find the percentage of each metal in the alloy.

1) 52%, 27%, 22% 2) 52%, 26%, 22%

3) 52%, 27%, 23% 4) 50%, 26%, 22%

4. The number of colour T.V. Sets produced in 1987 and 1990 in India are 12 lakhs and 22 lakhs units respectively Find the percentage increase in production in 1990 over 1987.

1) 83.7% 2) 83.6% 3) 83.5% 4) 83.3%

5. Mr. Saltar deposited Rs.4,200 in a bank which pays 12% interest per annum. How much interest will be get at the end of the year ?

1) Rs 504 2) Rs 505 3) Rs 506 4) Rs 507

6. 40% of 40 liters

1) 14L 2) 15L 3) 16L 4) 17L

7. $8\frac{1}{3}$% of 4 dozens

1) 0.66 2) 0.33 3) 0.56 4) 0.76

8. A person earns Rs 3,600 per month. He spends $8\frac{1}{3}\%$ of his income towards house rent and $33\frac{1}{3}\%$ towards food. Find the amounts he spends towards each item

   1) Rs 300, Rs 800 2) Rs 300, Rs 1,200

   3) Rs 400, Rs 1,200 4) Rs 500, Rs 1,200

9. The total assets of an individual are worth Rs 1,50,000 from this he gave 305 to his wife, 55% to his son and the remaining to philanthropic causes. Find the amounts he gave to his wife.

   1) Rs 46,000 2) Rs 48,000 3) Rs 45,000 4) Rs 49,000

10. The strength of a school is 685 out of these 26% being to B.C., 215 belong to S.C., and $\frac{1}{2}\%$ belong to S.T Remaining are forward category students. Find the number of students of S.C. category

    1) 145 2) 146 3) 144 4) 143

11. Increase of 80 by 10% is

    1) 90 2) 89 3) 87 4) 88

12. Increase 100km by $2\frac{1}{5}\%$

    1) 102.10km 2) 102.20km 3) 102.30km 4) 102.40km

13. Decrease of Rs 50 by 5%

    1) Rs 47 2) Rs 47.50 3) Rs 48 4) Rs 50

14. The cost f a bicycle is Rs 950. It's cost decreases by 5% every year due to usage. What will be its cost after a year ?

    1) Rs 903.5 2) Rs 904.5 3) Rs 902.5 4) Rs 901.5

15. The present cost of a house site is Rs 15,000. After one year its cost increase by 10% at the end of second year its cost would go up 15% over the cost at the end of first year. What would be the cost of the house site at the end of second year ?

    1) Rs 19, 875 2) Rs 18, 975 3) Rs 18, 900 4) Rs 18, 750

MULTI ANSWER TYPE

16. The cost price of an article 'A' is Rs. 160 and selling price of another article 'B' is Rs. 240. If the selling price of A will be equal to the cost price of B, then the profit after selling A is 20% on B, we get profit of 48 Rs. is

    1) 16.66% 2) 20% profit 3) 25% profit 4) $8\frac{1}{3}$% loss

17. A man sold a radio - set for Rs. 750 and gained one ninth of its cost price. Find the cost price of the radio and the gain percent earned by the man

    1) Rs. 675 and $\frac{100}{9}$% 2) Rs.675 & $\frac{100}{9}$%

    3) Rs. 765 and $\frac{100}{9}$% 4) Rs.765 & $\frac{82}{9}$%

REASONING ANSWER TYPE

18. *Statement I:* A man buys an article for Rs. 27.50 and sells it for Rs. 28.60 then his gain percentage is 4%.

    Statement II: The percentage of gain is $\left(\frac{\text{Gain} \times 100}{\text{C.P}}\right)$.

    1) Both Statement-I and Statement-II are true.
    2) Both Statement-I and Statement-II are false.
    3) Statement I is true, Statement II is false.
    4) Statement I is false, Statement II is true.

19. *Statement I:* If the annual increase in the population be 20% and present population be 10,000 then the population after 4 years is 20,736.

    Statement II: If the original population of a location be p and the annual growth rate be r%. The population after n years is $P\left(1+\frac{r}{100}\right)^n$.

    1) Both Statement-I and Statement-II are true.
    2) Both Statement-I and Statement-II are false.
    3) Statement I is true, Statement II is false.
    4) Statement I is false, Statement II is true.

20. *Statement I:* A dealer buys 200 quintals of wheat at Rs. 1200 a quintal. He spends Rs. 10,000 on transportation and storage. Then he sells the wheat at Rs. 13 per kg then the profit percentage of dealer is 8%.

    Statement II: Profit percentage = $\frac{\text{Profit}}{\text{C.P}} \times 100$.

    1) Both Statement-I and Statement-II are true.
    2) Both Statement-I and Statement-II are false.
    3) Statement I is true, Statement II is false.
    4) Statement I is false, Statement II is true.

21. *Statement I:* If x is 10% increased and then 10% decreased the resultant value is also x.
Statement II: If x% of y = y% of x.
1) Both Statement-I and Statement-II are true.
2) Both Statement-I and Statement-II are false.
3) Statement I is true, Statement II is false.
4) Statement I is false, Statement II is true.

COMPREHENSION TYPE

Writeup:1

When a bicycle manufacturer reduced its selling price by 50% the number of bicycles sold radically increased to 700%. Initially the manufacturer was getting only 140% profit.

22. What is the new selling price of a bicycle if initial selling price is Rs. 480?
1) 120 2) 240 3) 360 4) 480

23. What is the percentage increase of his profit
1) 1 2) 2
3) 3 4) no increase, no decrease

24. What is the initial number of bicycles if 1400 bicycles are sold now
1) 320 2) 550 3) 1000 4) 200

Writeup:2

If the present value of an article is P which increases by R% per annum, then its value

i) after n years = $P\left(1+\frac{R}{100}\right)^n$ ii) n years ago = $\frac{P}{\left(1+\frac{R}{100}\right)^n}$

25. The value of a machine depreciates at the rate of 10% per annum. If its present value of Rs. 1,62,000, what will be its worth after 2 years?
1) 400000 2) 131220 3) 566056 4) None of these

26. From the above problem what was the value of the machine 2 years ago (in Rs.)
1) 131220 2) 5466123 3) 200000 4) 50000

27. During one year, the population of a town increased by 5% and during the next year, the population decreased by 5%. If the total population is 9975 at the end of the second year, then what was the population size in the beginning of the first year
1) 10000 2) 20000 3) 30000 4) 40000

Writeup:3

Profit percentage = $\frac{\text{Profit}}{\text{C.P}} \times 100$, loss percentage = $\frac{\text{Loss}}{\text{C.P}} \times 100$

Discount = Marked price – S.P.

28. Cost price of 12 oranges is equal to the selling price of 9 organize and the discount on 10 oranges is equal to the profit on 5 organize. What is the percentage of the profit is

1) 20 2) 22.22 3) 16.66 4) 33.33

29. From the above problem what is the percentage of discount

1) 11.11 2) 16.67 3) 33.33 4) 44.44

30. From the above problem what is the difference between the profit percentage and discount percentage

1) 20 2) 22.22 3) 16.67 4) 15

MATRIX MATCHING TYPE

31.

Column-I	Column-II
a) If the cost price of 12 shirts is equal to the selling price of 10, then the percentage profit is	1) Rs. 220
b) If the cost price of 16 copies of a book is equal to the selling price of 20, then the percentage loss is	2) 20%
c) If the cost price and the selling price of a commodity are in the ratio 5 : 6, thus the percentage profit is	3) Rs. 200
d) If a shopkeeper sells tea at Rs. 160 per kg, he makes a loss of 20%. At what rate should he sell tea to make a profit of 10% is	4) 25%

32.

Column-I	Column-II
a) Two successive discounts of 10% and 20% are equal to single discount of	1) Rs. 3645
b) If x is 30% more than y then y is __% less than x is	2) Rs. 4000
c) Three successive discounts of 10%, 10% and 10% are given on article having marked price 5000 Rs. What is the selling price?	3) 28%
d) The selling price of an article is Rs. 3600 after discount of 10%, what is its cost price	4) $23\frac{1}{13}\%$

INTEGER ANSWER TYPE

33. Abhishek and Bhanu both are dealers of KML scooters. The price of a KML scooter is Rs. 28,000. Abishek gives a discount of 10% on whole, while Bhanu gives a discount of 12% on the first Rs. 20,000 and 8% on the rest Rs. 8,000. What is the difference between their selling prices is _____

KEY & HINTS

WORK SHEET – 1 (KEY)				
1) 4	2) 2	3) 1	4) 3	5) 2
6) 4	7) 2	8) 3	9) 1	10) 1
11) 2	12) 2	13) 2	14) 2	15) 4
16) 4	17) 4	18) 2	19) 4	20) 3
21) 4	22) 1	23) 2	24) 1	25) 4
26) 2				

HINTS

1. $5:4=\frac{5}{4}=\left(\frac{5}{4}\times 100\right)\%=125\%$

2. $3.5=\frac{35}{10}=\left(\frac{35}{10}\times 100\right)\%=350\%$

3. $63\%\ \text{of}\ 3\frac{4}{7}=\left(\frac{63}{100}\times\frac{25}{7}\right)=\frac{4}{9}=2.25$

4. $\text{Given expression}=\left(\frac{860}{100}\times 50+\frac{50}{100}\times 860\right)=430+430=860$

5. $\text{Given expression}=\left(\frac{45}{100}\times 750\right)-\left(\frac{25}{100}\times 480\right)=\left(337.50-120\right)=217.50$

6. $\text{Pass percentage}=\left(\frac{252}{270}\times 100\right)\%=\frac{280}{3}\%=93\frac{1}{3}\%$

7. $\text{Required percentage}=\left(\frac{5}{2250}\times 100\right)\%=\frac{2}{9}\%$

8. $\text{Required percentage}=\left(\frac{0.01}{0.1}\times 100\right)\%=\left(\frac{1}{10}\times 100\right)\%=10\%$

9. $\text{Required percentage}=\left(\frac{3}{24}\times 100\right)\%=\frac{25}{2}\%=12\frac{1}{2}\%$

10. Rebate = 6% of Rs. 6650 = Rs. $\left(\frac{6}{100}\times 6650\right) = Rs.399$.

Sales tax = 10% Rs. (6650 - 399) = Rs. $\left(\frac{10}{100}\times 6251\right) = Rs.625.10$.

$\therefore$ Final amount = Rs. (6251 + 625.10) = Rs. 6876.10

11. $\frac{384}{540} = \left(\frac{384}{540}\times 100\right)\% = 71\frac{1}{9}\%; \frac{425}{500} = \left(\frac{425}{500}\times 100\right)\% = 85\%$;

$\frac{570}{700} = \left(\frac{570}{700}\times 100\right)\% = 81\frac{3}{7}\%; \left(\frac{480}{660}\times 100\right)\% = 72\frac{8}{11}\%$

$\therefore \frac{425}{500}$ shows the best percentage

12. 0.15% of $33\frac{1}{3}\%$ of Rs. 10,000 $= Rs.\left[\frac{15}{100}\times\frac{1}{100}\times\left(\frac{100}{3}\times\frac{1}{100}\times 10000\right)\right] = Rs.5$.

13. 25% of $25\% = \frac{25}{100}\times\frac{25}{100} = \frac{1}{16} = 0.0625$.

14. Let the worth of the house be Rs. x.

Then $\frac{2}{7}\%$ of $x = 2800 \Leftrightarrow \left(\frac{2}{7}\times\frac{1}{100}\times x\right) = 2800 \Leftrightarrow x = \left(\frac{2800\times 100\times 7}{2}\right) = 9,80,000$

15. Let the number be x.

Then, 20% of $x = 120 \Leftrightarrow \left(\frac{20}{100}\times x\right) = 120 \Leftrightarrow x = \left(\frac{120\times 100}{20}\right) = 600$

$\therefore 120\%$ of $x = \left(\frac{120}{100}\times 600\right) = 720$.

16. Let the number be x.

Then, 35% of $x = 175 \Leftrightarrow \left(\frac{35}{100}\times x\right) = 175 \Leftrightarrow x = \left(\frac{175\times 100}{35}\right) = 500$.

Now, let y% of 175 = 500

Then, $\left(\frac{y}{100}\times 175\right) = 500 \Leftrightarrow y = \left(\frac{500\times 100}{175}\right) = \frac{2000}{7} = 285\frac{5}{7}$.

17. Let the number be x. Then $\frac{2}{5}$ of $\frac{1}{3}$ of $\frac{3}{7}$ of $x = 15 \Leftrightarrow x = \left(15\times\frac{7}{3}\times 3\times\frac{5}{2}\right) = \frac{525}{2}$

$\therefore 40\%$ of $\frac{525}{2} = \left(\frac{40}{100}\times\frac{525}{2}\right) = 105$.

18. Let the number be x. Then, $x-\frac{2}{5}x=510 \Leftrightarrow \frac{3}{5}x=510 \Leftrightarrow x=\left(\frac{510\times 5}{3}\right)=850$.

$\therefore$ 10% of 850 = 85.

19. Let the number be x. Then, 50% of $x-35\%$ of $x=12$

$\Leftrightarrow \frac{50}{100}x-\frac{35}{100}x=12 \Leftrightarrow \frac{15}{100}x=12 \Leftrightarrow x=\left(\frac{12\times 100}{15}\right)=80$

20. Let the number be x. then,

75% of $x+75=x \Leftrightarrow x-\frac{75}{100}x=75 \Leftrightarrow x-\frac{3}{4}x=75 \Leftrightarrow \frac{x}{4}=75 \Leftrightarrow x=300$.

21. Let the number be x.

Then, $x-35=\frac{80}{100}x \Leftrightarrow x-\frac{80}{100}x=35 \Leftrightarrow x=\frac{35\times 100}{20}=175 \Leftrightarrow \frac{4}{5}x=140$

22. Let the numbers be x and y. Then,

$x+y=\frac{28}{25}x \Leftrightarrow y=\frac{28}{25}x-x \Leftrightarrow y=\frac{3}{25}x \Leftrightarrow \frac{y}{x}=\left(\frac{3}{25}\times 100\right)\%=12\%$

23. Let the numbers be x and y.

Then, $y-25\%$ of $x=\frac{5}{6}y \Leftrightarrow y-\frac{5}{6}y=\frac{25}{100}x \Leftrightarrow \frac{y}{6}=\frac{x}{4} \Leftrightarrow \frac{x}{y}=\frac{4}{6}=\frac{2}{3}$.

24. Let the larger number be x.

Then, $x-20=\frac{20}{100}x \Leftrightarrow x-\frac{1}{5}x=20 \Leftrightarrow \frac{4}{5}x=20 \Leftrightarrow x=\left(20\times\frac{5}{4}\right)=25$

25. 5% of A + 4% of B $\frac{2}{3}$(6% of A + 8% of B)

$\Leftrightarrow \frac{5}{100}A+\frac{4}{100}B=\frac{2}{3}\left(\frac{6}{100}A+\frac{8}{100}B\right)$

$\Leftrightarrow \frac{1}{20}A+\frac{1}{25}B=\frac{1}{25}A+\frac{4}{75}B \Leftrightarrow \left(\frac{1}{20}-\frac{1}{25}\right)A=\left(\frac{4}{75}-\frac{1}{25}\right)B$

$\Leftrightarrow \frac{1}{100}A=\frac{1}{75}B \Leftrightarrow \frac{A}{B}=\frac{100}{75}=\frac{4}{3}$

26. Let the number be x. Then, error $=\frac{5}{3}x-\frac{3}{5}x=\frac{16}{15}x$.

Error % $=\left(\frac{16x}{15}\times\frac{3}{5x}\times 100\right)\%=64\%$

WORK SHEET – 2 (KEY)				
1) 1	2) 1	3) 2	4) 4	5) 1
6) 3	7) 2	8) 2	9) 3	10) 4
11) 4	12) 2	13) 2	14) 3	15) 2
16) 1,3	17) 1,2	18) 1	19) 1	20) 4
21) 4	22) 2	23) 4	24) 4	25) 2
26) 4	27) 1	28) 4	29) 2	30) 3
31) 2,4,2,1	32) 3,4,1,2	33) 240		

1. Required percent = $\frac{60}{75}\times 100 = 80$

2. By concept

3. $\frac{26}{50}\times 100$, $\frac{13}{50}\times 100$, $\frac{11}{50}\times 100 \Rightarrow 52\%, 26\%, 22\%.$

4. $\frac{10}{12}\times 100 = 83.3\%$

5. Saltar gets at the end of the year = $\frac{12}{100}\times 4200$ = Rs 504.

6. $\frac{40}{100}\times 40$ = 16 Liters

7. $\frac{25}{3}\times\frac{1}{100}\times 4 = \frac{1}{3} = 0.33$

8. $\frac{25}{3\times 100}\times 3600 = \text{Rs}300$ (The amount spent on house)

$\frac{100}{3\times 100}\times 3600 = \text{Rs } 1,200$ (The amount spent on food)

9. $\frac{30}{100} \times 1,50,000$ = Rs 45,00

10. $\frac{21}{100} \times 685 = 144$

11. $\frac{10}{100} \times 80 = 8$

80 + 8 = 88

12. By concept

13. $\frac{5}{100} \times 50 = 2.5$

50 - 2.5 = 47.5

14. $\frac{5}{100} \times 950 = 47.5$

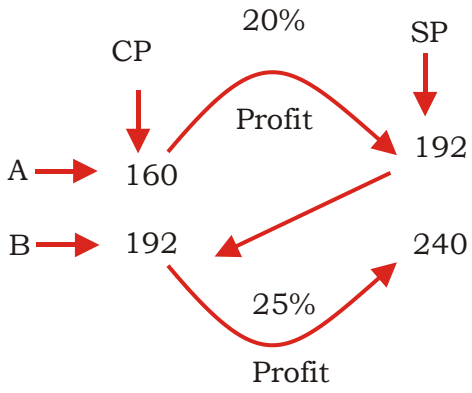
950 - 47.5 = 902.5

15. $\frac{10}{100} \times 15000 = \text{Rs } 1,500$

$\frac{15}{100} \times 16,500 = \text{Rs } 2,475$

16. Key : 1, 3

Sol:



$\therefore$ Profit of 48 Rs. and profit percentage = 25%

17. Key : 1, 2

Sol: S.P – C.P = $\frac{1}{9}$(C.P) $\Rightarrow \left(1+\frac{1}{9}\right)$xC.P = S.P

18. Key : 1
Sol: C.P = Rs. 2750, S.P = Rs. 28.60; So, gain = Rs (28.60 - 27.50) = Rs. 1.10

$\therefore$ Gain% $= \left(\frac{1.10}{27.50} x100\right)\% = 4\%$

19. Key : 1

Sol: $10,000\left(1+\frac{20}{100}\right)^4 = 10,000\left(\frac{6}{5}\right)^4 = 10,000x(1.2)^4 = 20,736$

20. Key : 4
Sol: C.P = 1200x 200 = 2,40,000
Transporation and storage cost = Rs. 10,000
Total C.P = 2,40,000 + 10,000 = 2,50,000
Total S.P = 13 x 200 x 100 = 2,60,000
Now, since SP > CP, hence thre will be profit.
Profit = Sp-CP = Rs. (2,60,000 - 2,50,000) = Rs. 10,000

Profit (%) = $\frac{\text{Profit}}{\text{CP}} x100 = 4\%$

21. Key : 4
22. Key : 2
Sol: Selling price reduced by 50% $\therefore$ New SP = 240 Rs.
23. Key : 4

Sol: CP	SP of 1 bicycle	No. of bicycles	Total profit
100(Let)	240	100(Let)	14000
100	120	700	14000

24. Key : 4
Sol: Number of bicycles sold is increased to 700%
$\therefore$ 700% $\rightarrow$ 1400 $\Rightarrow 100\% \rightarrow x$ $\therefore x = 200$
25. Key : 2
Sol: Value of the machine after 2 years

$= \text{Rs.}\left[162000x\left(1-\frac{10}{100}\right)^2\right] = \text{Rs.}\left(162000x\frac{9}{10}x\frac{9}{10}\right) = \text{Rs.}131220$

26. Key : 4
Sol: Value of the machine 2 years ago

$$= \text{Rs.}\left[\frac{162000}{\left(1-\frac{10}{100}\right)^2}\right] = \text{Rs.}\left(162000x\frac{10}{9}x\frac{10}{9}\right) = \text{Rs.}200000$$

27. Key : 1
Sol: Population in the beging of the first year

$$= \frac{9975}{\left(1+\frac{5}{100}\right)\left(1-\frac{5}{100}\right)} = \left(9975 x \frac{20}{21} x \frac{20}{19}\right) = 10000$$

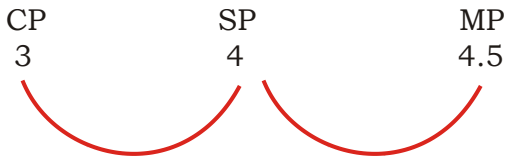
28. Key : 4

CP : SP = 3 : 4

Profit on 3 oranges = Rs. 1 (consider C.P of each organge = Rs. 1)

Profit = $\frac{1}{3} x 100$ = 33.33% and discount = 11.11%

Since



Profit is double that of discount

so, the percentage point difference = 33.3% - 11.1% = 22.22% point

29. Key : 2

Profit for 5 oranges = $\frac{5}{3}$ Rs.

$\therefore$ for 10 oranges discount = $\frac{5}{3}$ and 10 oranges CP = 10

$\therefore$ Discount percentage = x (say) $\Rightarrow 10x\frac{x}{100} = \frac{5}{3} \Rightarrow x = \frac{50}{3} = 16\frac{2}{3}\%$

30. Key : 3

Sol: The percentage difference = $33\frac{1}{3} - 16\frac{2}{3} = 16\frac{2}{3}$

31. Key: a $\rightarrow$ 2; b $\rightarrow$ 4; c $\rightarrow$ 2; d $\rightarrow$ 1

Sol: CP = 5k, SP = 6K, so SP > CP $\therefore$ Profit% = $\frac{6K-5K}{5K} x 100\%$

32. Key: a $\rightarrow$ 3; b $\rightarrow$ 4; c $\rightarrow$ 1; d $\rightarrow$ 2

a) $\left(a+b-\frac{ab}{100}\right)\% = \left(20+10-\frac{20\times10}{100}\right)\% = 28\%$

c) After first discount of 10% on Rs. 5000 becomes Rs. 5000 – 500 = Rs. 4500

After second discount of 10% on Rs. 4500 becomes Rs. 4500 – 450 = Rs. 4050

After third discount of 10% on Rs. 4050 becomes Rs.4050 – 405 = Rs.3645

33. Ans : 240

Sol: Abhisehk Bhanu

Discount $\rightarrow$ 2800 2400 + 640 = 3040

The difference in selling price is same as difference in discount whic Rs. 240 (=3040 - 2800)