NTS GAT General Past Papers Questions

Quantitative – Exam No. 25B

Percentage Problems

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Exercise:

1. The population of a town was 12,000 in 1980 and 16,000 in 1990. What was the percent increase in the population of the town during this period? (PP)

Solution:

We know that:

$$Percentage\ increase = \frac{Final\ value - Initial\ value}{Initial\ value} \times 100$$

$$Percentage\ increase = \frac{16{,}000 - 12{,}000}{12{,}000} \times 100$$

$$Percentage\ increase = \frac{4{,}000}{12{,}000} \times 100$$

$$Percentage\ increase = \frac{1}{3} \times 100$$

$$Percentage\ increase = 33.3\ \%$$

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

2. A merchant was selling an item at a certain price, then marked it down 20% for a spring sale. During the summer, he marked the item down another 20% from its spring price. If the item sold at the summer price, what percent of the original price did it sell for? (PP)

Solution:

In this question, we can say that 20% discount is given twice. We know that:

$$Percent = \left[\left(1 - \frac{1^{st}\ discount}{100}\right) \times \left(1 - \frac{2^{nd}\ discount}{100}\right)\right] \times 100$$

$$Percent = \left[\left(1 - \frac{20}{100}\right) \times \left(1 - \frac{20}{100}\right)\right] \times 100$$

$$Percent = [(1 - 0.2) \times (1 - 0.2)] \times 100$$

$$Percent = [(0.8) \times (0.8)] \times 100$$

$$Percent = [0.64] \times 100$$

$$Percent = 64\ \%$$

3. A company bought a total of 60 computers and 20 printers to modernize billing operations. If the price of each computer was three times the price of each printer, what percent of the total cost of the purchase was the cost of the printers? (PP)

Solution:

$$Price\ of\ one\ computer = 3P$$

$$Price\ of\ 60\ computers = 60 \times 3P$$

$$Price\ of\ 60\ computers = 180P$$

$$Price\ of\ one\ printer = P$$

$$Price\ of\ 20\ printers = 20P$$

$$Total\ purchasing\ price = 180P + 20P$$

$$Total\ purchasing\ price = 200P$$

$$Percentage\ of\ printers = \frac{Price\ of\ 20\ printers}{Total\ purchasing\ price} \times 100$$

$$Percentage\ of\ printers = \frac{20P}{200P} \times 100$$

$$Percentage\ of\ printers = \frac{1}{10} \times 100$$

$$Percentage\ of\ printers = 10\ \%$$

4. A merchant wants to sell his goods at cost price, but weighs 950 gm for a kg of weight. What is real gain or loss percent? (PP)

Solution:

As the merchant weighs 50 gm for each 1 kg, so he will earn profit of 50 gm per kg. The profit percentage can be calculated as follows:

$$Profit\ percentage = \frac{50}{950} \times 100$$

$$Profit\ percentage = \frac{1}{19} \times 100$$

$$Profit\ percentage = 5\frac{5}{19}\%$$

5. If waiter tips more than 15 percent on a meal, and the tip is more than 4 rupees, what is the least possible cost of the meal before tip, rounded to nearest rupees? (PP)

Solution:

$$\frac{15}{100} \times x = 4$$

$$x = \frac{4 \times 100}{15}$$

$$x = \frac{400}{15}$$

$$x = 26.67 \cong 27$$

6. The price goes up from Rs. 80 to Rs. 100. What is the percentage increase? (PP)

Solution:

We know that:

$$Percentage\ increase = \frac{Final\ value - Initial\ value}{Initial\ value} \times 100$$

$$Percentage\ increase = \frac{100 - 80}{80} \times 100$$

$$Percentage\ increase = \frac{20}{80} \times 100$$

$$Percentage\ increase = \frac{1}{4} \times 100$$

$$Percentage\ increase = 25\ \%$$

7. What percent of 25 is 5? (PP)

Solution:

$$\frac{x}{100} \times 25 = 5$$

$$x = \frac{5 \times 100}{25}$$

$$x = \frac{500}{25}$$

$$x = 20\ \%$$

8. 1/6 % of what is 6? (PP)

Solution:

$$\frac{1}{6} \times \frac{1}{100} \times x = 6$$

$$x = 6 \times 6 \times 100$$

$$x = 3{,}600$$

9. When 10% of 30 is added in x% of 70, the result is 80. Find x? (PP)

Solution:

$$\frac{10}{100} \times 30 + \frac{x}{100} \times 70 = 80$$

$$\frac{300}{100} + \frac{70x}{100} = 80$$

$$3 + \frac{70x}{100} = 80$$

$$\frac{70x}{100} = 80 - 3$$

$$\frac{70x}{100} = 77$$

$$x = \frac{77 \times 100}{70}$$

$$x = \frac{7{,}700}{70}$$

$$x = 110$$

10. A pressure cooker was sold for Rs. 120. One fifth part of sales price was sales tax, and one third part of the remaining was profit. What is cost price of pressure cooker? (PP)

Solution:

We know that sales tax is one fifth part of sales price, so:

$$Sales\ tax = \frac{1}{5}(Sales\ cost)$$

$$Sales\ tax = \frac{1}{5}(120) = 24$$

$$Remaining = 120 - 24 = 96$$

We know that one third of the remaining is profit, so:

$$Profit = \frac{1}{3}(Remaining)$$

$$Profit = \frac{1}{3}(96) = 32$$

We have to find the cost price, so:

$$Cost\ price = Remaining - profit$$

$$Cost\ price = 96 - 32 = 64$$

11. If two third of a class is boys, how many girls are in the class of 48 students? (PP)

Solution:

We know that two third of a class represents boys, so:

$$Boys = \frac{2}{3}(48) = \frac{2}{1}(16) = 32$$

$$Girls = Class - Boys$$

$$Girls = 48 - 32 = 16$$

12. Sara paid Rs. 1500 for a computer after receiving a 20% discount. What was the price of the computer before discount? (PP)

Solution:

We know that Sara is paying 80% (100 – 20 = 80) amount of computer, so:

$$\frac{80}{100} \times x = 1{,}500$$

$$x = \frac{1{,}500 \times 100}{80} = 1{,}875$$

13. If x is 20 percent greater than 88, then find x? (PP)

Solution:

$$x = (20\%\ of\ 88) + 88$$

$$x = \left(\frac{20}{100} \times 88\right) + 88$$

$$x = \left(\frac{1}{5} \times 88\right) + 88$$

$$x = (17.6) + 88$$

$$x = 105.6$$

14. 0.9% is equal to what? (PP)

(A) 9/100

(B) 9/10

(C) 9/1000

(D) 90

Solution:

$$0.9\% = \frac{0.9}{100} = \frac{9}{100 \times 10} = \frac{9}{1000}$$

15. 24% of 2 is what? (PP)

Solution:

$$\frac{24}{100} \times 2 = x$$

$$x = \frac{48}{100} = 0.48$$

16. 0.5% of 900 is what? (PP)

Solution:

$$\frac{0.5}{100} \times 900 = x$$

$$x = \frac{5}{100 \times 100} \times 900$$

$$x = \frac{450}{100 \times 1} \times 9$$

$$x = \frac{450}{100} = 4.5$$

17. In a class of 80 students, 30% of the students are girls. Find the number of boys? (PP)

Solution:

$$Girls\ percentage = 30\%$$

$$Boys\ percentage = 100 - 30 = 70\%$$

$$Number\ of\ boys = \frac{70}{100} \times 80$$

$$Number\ of\ boys = \frac{7}{1} \times 8 = 56$$

18. If 93% students passed the exam and 259 students failed, find the total number of students? (PP)

Solution:

$$Pass\ percentage = 93\%$$

$$Fail\ percentage = 100 - 93 = 7\%$$

We can say that 7% of class is 259, so:

$$\frac{7}{100} \times x = 259$$

$$x = \frac{259 \times 100}{7}$$

$$x = \frac{37 \times 100}{1} = 3{,}700$$

19. What is 5% of 2% of 50? (PP)

Solution:

$$x = \frac{5}{100} \times \frac{2}{100} \times 50$$

$$x = \frac{500}{10{,}000} = \frac{5}{100}$$

$$x = 0.05$$

20. If a TV is sold at a price of Rs. 9,600 then it would gain profit. However, if sold in Rs. 6,600, then it would cause the loss, which would be double the profit. What is the actual purchase price of the TV? (PP)

Solution:

Let we assume purchasing cost is "x".

$$Profit = 9{,}600 - x$$

$$Loss = x - 6{,}600$$

$$Loss = 2(profit)$$

Substituting the values, we get:

$$x - 6{,}600 = 2(9{,}600 - x)$$

$$x - 6{,}600 = 19{,}200 - 2x$$

$$x + 2x = 19{,}200 + 6{,}600$$

$$3x = 25{,}800$$

$$x = \frac{25{,}800}{3} = 8{,}600\ rupees$$

21. Simplify: (PP)

$$\frac{6}{1000} = \_\_\_\_\%$$

Solution:

$$= \frac{6}{1000} = 0.006$$

To convert into percentage, we will multiply this value by 100, so:

$$= 0.006 \times 100 = 0.6\%$$

22.45% of x is 405. Find x? (PP)

Solution:

$$\frac{45}{100} \times x = 405$$

$$x = \frac{405 \times 100}{45}$$

$$x = \frac{40{,}500}{45}$$

$$x = 900$$

23.¼ of this year's seniors have an average above 90. And ½ of the remaining students have an average between 80 and 90. What part of the senior class has an average below 80? (PP)

Solution:

Let,

$$Number\ of\ students = 40$$

$$Students\ with\ 90 + marks = \frac{1}{4} \times 40 = 10$$

$$Remaining\ students = 40 - 10 = 30$$

$$Students\ with\ 80 - 90\ marks = \frac{1}{2} \times 30 = 15$$

$$Students\ with\ less\ than\ 80\ marks = 30 - 15 = 15$$

We have to find part of the senior class having an average below 80:

$$= \frac{Students\ with\ less\ than\ 80\ marks}{Total\ number\ of\ students} = \frac{15}{40} = \frac{3}{8}$$

24. What % of 3 is 6? (PP)

Solution:

$$\frac{x}{100} \times 3 = 6$$

$$x = \frac{6 \times 100}{3}$$

$$x = \frac{3 \times 100}{1}$$

$$x = 200\ \%$$

25. First discount from 100 was given 25%. Another discount of 20% was given. Find the total discount? (PP)

Solution:

$$Single\ discount = \left[1 - \left\{\left(1 - \frac{1^{st}\ discount}{100}\right) \times \left(1 - \frac{2^{nd}\ discount}{100}\right)\right\}\right] \times 100$$

$$Single\ discount = \left[1 - \left\{\left(1 - \frac{25}{100}\right) \times \left(1 - \frac{20}{100}\right)\right\}\right] \times 100$$

$$Single\ discount = [1 - \{(1 - 0.25) \times (1 - 0.2)\}] \times 100$$

$$Single\ discount = [1 - \{(0.75) \times (0.8)\}] \times 100$$

$$Single\ discount = [1 - \{0.6\}] \times 100$$

$$Single\ discount = [0.4] \times 100$$

$$Single\ discount = 40\ \%$$

26. Shariri takes 25 paisa as commission from Rs. 20 worth the merchandise she sells? Find the percentage of her commission? (PP)

Solution:

$$Commission\ Percentage = \frac{Commission\ amount}{Total\ amount} \times 100$$

$$Commission\ Percentage = \frac{25\ paisa}{20\ rupees} \times 100$$

Converting to same units, we get:

$$Commission\ Percentage = \frac{25\ paisa}{(20 \times 100)\ paisa} \times 100$$

$$Commission\ Percentage = \frac{25}{20} = \frac{5}{4}$$

$$Commission\ Percentage = 1.25\ \%$$

27. A home was sold in Rs. 600,000 and the commission agent takes 1% commission from both the buyer and seller. Find the amount of commission? (PP)

Solution:

$$Commission\ from\ both\ sides = 1\% + 1\% = 2\%$$

$$Comission\ amount = Commission\ percentage \times Selling\ cost$$

$$Comission\ amount = 2\% \times 600{,}000$$

$$Comission\ amount = \frac{2}{100} \times 600{,}000$$

$$Comission\ amount = \frac{2}{1} \times 6{,}000$$

$$Comission\ amount = 12{,}000$$

28. 25% of what is 625? (PP)

Solution:

$$\frac{25}{100} \times x = 625$$

$$x = \frac{625 \times 100}{25}$$

$$x = \frac{25 \times 100}{1}$$

$$x = 2500$$

29. 60% of a number when added to other number then the other number is increased by 1.5 times to its original, what is the ratio between two numbers? (PP)

Solution:

Let the two numbers be x and y. So,

$$60\%\ of\ x + y = 1.5 \times y$$

$$\frac{60}{100} \times x + y = 1.5y$$

$$0.6x + y = 1.5y$$

$$0.6x = 1.5y - y$$

$$0.6x = 0.5y$$

$$\frac{y}{x} = \frac{0.6}{0.5}$$

$$y : x = 6 : 5$$

30. If Ahmad purchases a watch for Rs. 600 and pays 15% sales tax, find the total amount spent on purchase? (PP)

Solution:

We know that:

$$Total\ amount = Purchasing\ cost + Sales\ tax$$

$$Total\ amount = 600 + (15\%\ of\ 600)$$

$$Total\ amount = 600 + \left(\frac{15}{100} \times 600\right)$$

$$Total\ amount = 600 + \left(\frac{15}{1} \times 6\right)$$

$$Total\ amount = 600 + (90)$$

$$Total\ amount = 690\ rupees$$

31. Find the value of x: (PP)

$$125\%\ of\ 260 + x\%\ of\ 700 = 500$$

Solution:

$$\left(\frac{125}{100} \times 260\right) + \left(\frac{x}{100} \times 700\right) = 500$$

$$\left(\frac{125}{5} \times 13\right) + \left(\frac{x}{1} \times 7\right) = 500$$

$$(25 \times 13) + (7x) = 500$$

$$325 + 7x = 500$$

$$7x = 500 - 325$$

$$7x = 175$$

$$x = \frac{175}{7} = 25$$

32. A man completes 2/15 of his journey by aero-plane, 2/5 by train and the rest by taxi. What part of his journey does he complete by taxi? (PP)

Solution:

Let the distance travelled be 15 kilometer, so:

$$Journey\ by\ aeroplane = \frac{2}{15} \times 15 = 2\ km$$

$$Journey\ by\ train = \frac{2}{5} \times 15 = 6\ km$$

$$Remaining\ distance = 15 - 2 - 6 = 7\ km$$

$$Part\ OR\ Fraction = \frac{Remaining\ distance}{Total\ distance}\ \frac{7}{15}$$

33. A team has won 60 percent of the 20 games it has played so far in this season. If the team plays a total of 50 games all seasons and wins 80 percent of the remaining games, how many games will the team win for the entire season? (PP)

Solution:

$$Total\ games\ win = (60\%\ of\ 20) + (80\%\ of\ 30)$$

$$Total\ games\ win = \left(\frac{60}{100} \times 20\right) + \left(\frac{80}{100} \times 30\right)$$

$$Total\ games\ win = \left(\frac{6}{1} \times 2\right) + \left(\frac{8}{1} \times 3\right)$$

$$Total\ games\ win = (12) + (24) = 36$$

34. If the daily wage of a person is increased by 15%, he now gets Rs. 92 per day. What was his daily wage before the increase? (PP)

Solution:

We have to find 115% of what is 92, so:

$$\frac{115}{100} \times x = 92$$

$$x = \frac{92 \times 100}{115} = \frac{92 \times 20}{23}$$

$$x = \frac{4 \times 20}{1} = 80\ rupees$$