

## **CHAPTER : RATIO-PROPORTION**

### **Topics to be covered with examples:**

- Concept of Ratio
- Method to find Equivalent ratios.
- Concept of proportion, Rule of proportion
- Fourth proportion
- Third proportion
- Mean proportion
- Componendo, dividend, alternendo, inverse
- Word problems interpretation and method to solve.

Q.1. Form the compound ratio of the ratios 45 : 75, 3 : 4, 51 : 68 and 256 : 81.

Q.2. If  $A : B = 6 : 7$  and  $B : C = 8 : 9$ , find  $A : B : C$ .

Q.3. The sum of two numbers is 20, and their difference is  $2\frac{1}{2}$ . Find the ratio of the numbers?

Q.4. If 0.7 of one number be equal to 0.075 of another, what is the ratio of two numbers?

Q.5. Find a fraction which shall bear the same ratio to  $\frac{1}{27}$  that  $\frac{3}{11}$  dose to  $\frac{5}{9}$ .

Q.6. Two sums of money are proportional to 8:9. If the first is Rs 20, what is the other?

Q.7. Find two numbers in the ratio of  $5\frac{5}{7}$  to 5 such that when each is diminished by  $12\frac{1}{2}$ , they shall become in the ratio of  $3\frac{2}{3}$  to 3.

Q.8. Divide 37 into two parts such that 5 times one part and 11 times the other is together 227.

Q.9. Find a ratio equal to  $\frac{4}{5}$  whose antecedent is 9.

Q.10. Find the value of x in the following proportions:

(1)  $5:15 = 2:x$

(2)  $75:3 = x:9$ .

Q.11. Calculate a fourth proportional to the numbers:

- (1) 1,2,3                      (2) 490, 70, 69                      (3) 2.5, 1.5, 1.5

Q.12. If 30 men do a piece of work in 27 days, in what time can 18 men do another piece of work 3 times as great?

Q.13. When wheat is Rs 1.30 per kg, 60 men can be fed for 15 days at a certain cost. How many men can be fed for 45 days at the same cost, when wheat is Rs 1 per kg?

Q.14. If a family of 7 persons can live on Rs 840 for 36 days, how long can a family of 9 persons live on Rs 810?

Q.15. If 5 horses eat 18 quintals of oats in 9 days, how long at the same rate will 66 quintals last for 15 horses?

Q.16. If 1000 copies of a book of 13 sheets require 26 reams of paper, how much paper is required for 5000 copies of a book of 17 sheets?

Q.17. If the carriage of 810 kg for 70 km costs Rs 45, what will be the cost of the carriage of 840 kg for a distance of 63 km at half the former rate?

Q.18. If 300 men can do a piece of work in 16 days, how many men would do  $\frac{1}{4}$  of the same work in 15 days?

Q.19. Divide Rs 324.36 into three parts in the proportion of 5: 6 : 7.

Q.20. Divide Rs 53.95 between A, B and C such that A gets thrice as much as B, and C one-third as much as B. Find A share?

Q.21. Divide Rs 91.30 between A, B and C such that A gets  $1\frac{1}{2}$  times as much as C and B  $2\frac{1}{2}$  times as much as C. Find B share ?

Q.22. A body of 7300 troops is formed of 4 battalions, so that  $\frac{1}{2}$  of the first,  $\frac{2}{3}$  of the second,  $\frac{3}{4}$  of the third and  $\frac{4}{5}$  of the fourth are all composed of the same number of men. How many men are there in each battalions?

Q.23. The estate of a bankrupt person worth of Rs 21000 is to be divided among four creditors whose debts are – A's to B's, as 2:3, B's to C's as 4:5, C's to D's as 6:7. What amount must each receive?

**Q24. Three numbers A, B and C are in the ratio of 12 : 15 : 25. If sum of these numbers is 312, find the ratio between the difference of B and A and the difference of C and B.**

- (a) 3 : 7      (b) 10 : 3      (c) 3 : 10      (d) 7 : 3      (e) None of these

**Q25. If  $A : B = 3/4$ ,  $B : C = 4/5$ ,  $C : D = 5/6$ , then  $A : D$  will be:**

- (a) 2 : 3      (b) 4 : 3      (c) 1 : 2      (d) 2 : 1      (e) None of these

**Q26. The ratio of present ages of Suresh and Mahesh is 7 : 5. If after 6 years their ages will be in the ratio of 4 : 3, the present age of Mahesh is:**

- (a) 32 years      (b) 36 years      (c) 30 years      (d) 35 years  
(e) None of these

**Q28. In a mixture of 60 litres, the ratio of milk and water is 2 : 1. What amount of water must be added to make the ratio of milk and water as 1 : 2?**

- (a) 75 litres      (b) 55 litres      (c) 60 litres      (d) 65 litres  
(e) None of these

**Q29. Mixture of milk and water has been kept in two separate containers. Ratio of milk to water in one of the containers is 5 : 1 and that in the other container 7 : 2. In what ratio the mixtures of these two containers should be added together so that the quantity of milk in the new mixture may become 80%?**

- (a) 2 : 3    (b) 3 : 2    (c) 4 : 5    (d) 1 : 3    (e) None of these

**Q30. Seven men, five women and eight children were given as assignment of distributing 2000 books to students in a school over a period of three days. All of them distributed books on the first day. One of the second day two women and three children remained absent and on the third day three men and five children remained absent. If the ratio of the number of books distributed in a day by a man, a woman and a child was 5 : 4 : 2 respectively, a total of approximately how many books were distributed on the second day?**

- (a) 1000            (b) 800            (c) 650            (d) 900  
(e) Cannot be determined

**Q31. A sum of money is divided among A, B, C and D in the ratio 3 : 5 : 8 : 9 respectively. If the share of D Rs. 1,872 more than the share of A, then what is the total amount of money of B & C together?**

- (a) Rs. 4,156    (b) Rs. 4,165    (c) Rs.4,056    (d) Rs. 4,065  
(e) None of these

**Q32. The ratio of the incomes of two persons is 5 : 3 and that of their expenditure is 9 : 5. If they save Rs. 2600 and Rs. 1800 respectively, then their incomes are:**

- (a) Rs. 8000, Rs. 4800      (b) Rs. 6000, Rs. 3600      (c) Rs. 10000, Rs. 60000  
(d) Rs. 9000, Rs. 5400      (e) None of these

**Q33. A bag contains one rupee, 50 paise and 25 paise coins in the ratio 2 : 3 : 5. Their total value is Rs. 144. The value of 50-paise coins is:**

- (a) Rs. 24      (b) Rs. 36      (c) Rs. 48      (d) Rs. 72  
(e) None of these

**Q34. Two numbers are in the ratio  $1\frac{1}{2}$  :  $2\frac{2}{3}$ . When each of these is increased by 15, they become in the ratio  $1\frac{2}{3}$  :  $2\frac{1}{2}$ . The greater of the numbers is:**

- (a) 27      (b) 36      (c) 48      (d) 64  
(e) None of these

**Q35. Determine the ratio of the number of people having characteristic X to the number of people having characteristic Y in a population of 100 subjects from the following table:**

**Having X and Y - 10**

**Having X but not Y - 30**

**Having Y but not X - 20**

**Having neither X nor Y - 40**

- (a) 4 : 3                      (b) 3 : 2                      (c) 1 : 2                      (d) 2 : 3  
(e) None of these

**Q36. The incomes of A, B and C are in the ratio 7 : 9 : 12 and their spending are in the ratio 8 : 9 : 15. If A saves one-fourth of his income, then the savings of A, B and C are in the ratio of:**

- (a) 69 : 56 : 48                      (b) 47 : 74 : 99                      (c) 37 : 72 : 49  
(d) 56 : 99 : 69                      (e) None of these

**Q37. The students in three classes are in the ratio 4 : 6 : 9. If 12 students are increased in each class, the ratio changes to 7 : 9 : 12. Then the total number of students in the three classes before the increase is:**

- (a) 95                      (b) 76                      (c) 100                      (d) 114  
(e) None of these



**Q38. When X is subtracted from the numbers 9, 15 and 27, then remainders are in the continued proportion. What is the value of X?**

- (a) 8                      (b) 6                      (c) 4                      (d) 5  
(e) None of these

**Q39. A certain amount was to be distributed among A, B and C in the ratio 2 : 3 : 4, but was erroneously distributed in the ratio 7 : 2 : 5. As a result of this, B received Rs. 40 less. What is the actual amount?**

- (a) Rs. 210              (b) Rs. 270              (c) Rs. 230              (d) Rs. 280  
(e) None of these

**Q40. A student obtained equal marks in History and Sociology. The ratio of marks in Sociology and Geography is 2 : 3 and the ratio of marks in History and Philosophy is 1 : 2. If he has scored an aggregate of 55% marks. The maximum marks in each subject are same. In how many subjects did he score equal to or greater than 60% marks?**

- (a) 1                      (b) 2                      (c) 3                      (d) 0                      (e) none of these

**Q41. The concentration of petrol in three different mixtures (petrol and kerosene) is  $\frac{1}{2}$ ,  $\frac{3}{5}$  and  $\frac{4}{5}$  respectively. If 2 litres, 3 litres and 1 litre are taken from these three different vessels and mixed. What is the ratio of petrol and Kerosene in the new mixture?**

- (a) 4 : 5                      (b) 3 : 2                      (c) 3 : 5                      (d) 2 : 3  
(e) none of these

**Q42. The value of a diamond is directly proportional to the square of its weight. A diamond unfortunately breaks into three pieces with weights in the ratio of 3: 4: 5, thus a loss of Rs. 9.4 lakh is incurred. What is the actual value of diamond:**

- (a) 28.8 lakh              (b) 13.5 lakh              (c) 14.4 lakh              (d) 18.8 lakh  
(e) none of these

**Q43. A and B are two alloys of copper and tin prepared by mixing the respective metals in the ratio of 5 : 3 and 5 : 11 respectively. If the alloys A and B are mixed to form a third alloy C with an equal proportion of copper and tin, what is the ratio of alloys A and B in the new alloy C?**

- (a) 3 : 5                      (b) 4 : 5                      (c) 3 : 2                      (d) 2 : 3  
(e) none of these

**Q44. 10 years ago the age of Karishma was  $\frac{1}{3}$ rd of the age of Babita. 14 years hence the ratio of ages of Karishma and Babita will be 5 : 9. Find the ratio of their present ages:**

- (a) 13 : 29      (b) 11 : 27      (c) 29 : 17      (d) 13 : 25  
(e) none of these