

# RBI PHASE 1 RECAP

10th JULY '18

QUANT – RATIO-PROPORTION

# RATIO-PROPORTION



## MEANING OF RATIO

The comparison between two quantities in terms of magnitude is called the ratio, i.e., it tells us that the one quantity is how many times the other quantity. So the ratio of any two quantities is expressed as  $a/b$  or  $a:b$ . It is read as  $a$  is to  $b$ .

## THINGS TO BE REMEMBER

- \*in a ratio, the order of the terms is very important.
- \*the units to be compared should be of the same kind.
- \*the value of a ratio does not change when the numerator and denominator both are multiplied or divide by the same quantity.
- \*the ratio of two fractions can be expressed in ratio of integers.

# RATIO-PROPORTION



## MEANIGN OF PROPORTION

An equality of two ratios is called a proportion and we say that the four numbers are in proportion.

i.e., if  $a/b = c/d$ , or  $a : b = c : d$ , then we say that  $a, b, c, d$  are in proportion and written as  $a : b :: c : d$ . it is read as  $a$  is to  $b$  as  $c$  is to  $d$ .

here  $a$  and  $d$  are called 'extremes' and  $b$  and  $c$  are called 'means'.

If four numbers are in proportion then product of the extremes is equal to the product of the means.

# RATIO-PROPORTION



**Q.1) If in an examination the scores of Shruthi and Tanuja are in the ratio 7:11, then the ratio of the sum of Tanuja's score and 2 times Shruthi's score to the sum of Shruthi's score and 3 times Tanuja's score is ....?**

- [a] 29:32**
- [b] 32:29**
- [c] 5:8**
- [d] 14:33**

**Solution 1.(c)**

**Let Shruthi's score be  $7X$  then, Tanuja's score is  $11X$ . The sum of Tanuja's score and 2 times Shruthi's score =  $11X + 2(7X) = 25X$**

**The sum of Shuthi's score and 3 times Tanuja's score  
=  $7X + 3(11X) = 40X$**

**So, the required ratio is  $25X:40X = 5:8$**

# RATIO-PROPORTION

**Q.2) A salesman for a company gets an incentive for every unit of product he sells apart from his fixed salary. He gets RS. 8,000 and RS. 9,000 for 150 units and 200 units he sold respectively. If he sells 400 units, what is his income per unit?**

- [a] RS.32.50**
- [b] RS. 30**
- [c] RS. 27.50**
- [d] RS. 20**

# RATIO-PROPORTION



**Solution 2. (a)**

**Let the salesman fixed salary be RS. X**

**And the incentive per unit sold be RS. Y**

$$X + 150Y = 8000 \dots\dots\dots(1)$$

$$X + 200Y = 9000 \dots\dots\dots(2)$$

$$(2) - (1)$$

$$50Y = 1000$$

$$Y = 20$$

$$X = 9000 - 200(20)$$

$$= 9000 - 4000 = 5000$$

**His total income when he sold 400 units**

$$X + 400Y = 5000 + 400(20) = 13000$$

$$\text{His income per unit} = 13000 / 400 = \text{RS. } 32.5$$

# RATIO-PROPORTION



**1.3) Thomas and Lala who live in a remote location, use special services under a particular scheme from a special provider in which the bill depends on the number of outgoing calls made and the number of incoming calls received. For every outgoing call made, the charge is RS. 2.50 and for every incoming call received the charge is RS.1. In a particular month, the number of calls received by Thomas was 10 more than that received by Lala.**

**Q.3) If Thomas received a bill of RS. 250 and the number of calls received by Lala is 60, then what is the total number of calls (i.e., incoming calls received and outgoing calls made) for Thomas and Lala together, if the number of calls made by Lala is 20 more than that made by Thomas?**

- [a] 324**
- [b] 314**
- [c] 304**
- [d] 294**

# RATIO-PROPORTION



**Solution 3. (d)**

**The number of calls received by Lala is 60. Then the number of calls received by Thomas  
=  $60+10 = 70$**

**Let the number of outgoing calls made by Thomas be Y.**

**Then, the bill for Thomas = RS. 250 =  $Y(2.50) + 70(1)$   
=  $Y (2.50) = 180$**

**Y= 72**

**Number of outgoing calls made by Lala =  $72+20 =92$**

**The total number of calls  
=  $(70+72) + (60+92) = 294$**

# RATIO-PROPORTION



**Q.4) In an exam, the ratio of Ajay's marks and Balu's marks is 4:5. If each of them had scored 36 more marks, the ratio of their marks would be 7:8. To get 24 more marks than that of Ajay, how much more marks should Balu have to get and what will be the ratio then?**

- [a] 24, 5:8**
- [b] 12, 4:6**
- [c] 36, 3:6**
- [d] 72, 4:7**

# RATIO-PROPORTION



**Solution 4.(b)**

**Let Ajay's marks and Balu's marks be  $4X$  and  $5X$  respectively.**

$$4X + 36 / 5X + 36 = 7/8$$

$$8(4X + 36) = 7(5X + 36)$$

$$32X + 288 = 35X + 252$$

$$3X = 36$$

$$X = 12$$

**Balu's marks =  $5X = 60$  and Ajay's marks =  $4X = 48$**

**To get 24 more marks than that of Ajay Balu have to get  $48 + 24 = 72$**

$$72 - 60 = 12$$

**12 more marks Balu have to get.**

**The ratio will be  $48:72 = 4:6$**

# RATIO-PROPORTION

**Q.5) A party is attended by a total of 60 persons. If the ratio of men and women is 3:2, how many more men must join the party so that the ratio becomes 7:3. If the same number of women would also increase, what will be the ratio then?**

- [a] 20, 14: 11**
- [b] 24, 12:13**
- [c] 30, 10:12**
- [d] 20, 13:11**

# RATIO-PROPORTION

**Solution 5.(a)**

**Total persons = 60**

**Total R = 3+2 =5**

**1R = 60/5 = 12**

**Number of women = 12 x 2 = 24**

**Number of men = 12x 3 = 36**

**After the more men have joined, number of females is 3 parts**

**3R = 24 so, 1R = 8**

**7R = 8 x 7 = 56**

**Number of more men = 56 – 36 = 20**

**If same number of women join the party, the ratio will be**

**56: 44 = 14 : 11**

# RATIO-PROPORTION

**Q.6) A bag has coins in the denominations of 50 p, 25 p and 20 p in the ratio 4:2:1. The total value of the coins is Rs. 54. If 25 paise coins are replaced with 1 Re. Coin, what will be the new ratio? (keeping the total money constant)**

- [a] 6: 2: 1**
- [b] 8: 2: 1**
- [c] 8: 1: 2**
- [d] 2: 4: 8**

**Solution 6.(c)**

**Let the number of 50 p, 25 p and 20 p coins be  $4X$ ,  $2X$  and  $X$  respectively. Total value of coins =  $50(4X) + 25(2X) + 20X = 5400$**

$$270X = 5400$$

$$X = 20$$

**The number of 25 paise coins =  $2X = 40$**

**40 coins of 25 paise = 10 coins of 1RS.**

**Ratio will be = 80 : 10: 20 or 8:1:2**

# RATIO-PROPORTION

**Q.7) There are five vessels. Each vessel is partially filled with milk. The quantities of milk in the 5 vessels are in the ratio 2: 3: 4: 5: 6. The capacities of the vessels are in the ratio 1: 2: 3: 4: 5. Let A be the vessel in which the quantity of milk as a fraction of its capacity is the least and E be the vessel in which it is the greatest. The total quantity of milk in the four vessels other than A is 14308 ml. find the total quantity of milk (in ml) in the four vessels other than E.**

- [a] 18324**
- [b] 18396**
- [c] 18216**
- [d] 18144**

# RATIO-PROPORTION

**Solution 7.(b)**

**Let the quantities of milk in the vessels be  $2X, 3X, 4X, 5X, 6X$ .**

**Let the capacities of the vessels be  $Y, 2Y, 3Y, 4Y, 5Y$ .**

**Quantities of milk as fractions of the capacities are:**

**$2X / Y, 3X/2Y, 4X/3Y, 5X/4Y, 6X/5Y$**

**The first is E and the last is A.**

$$2X + 3X + 4X + 5X = 14308$$

$$X=1022$$

**Total quantity of milk in the four vessels other than E**

$$= 3X + 4X + 5X + 6X$$

$$= 18X = 18396$$

# RATIO-PROPORTION

**Q.8) The ratio of the incomes of P, Q and R in a certain month is 15: 16: 20. The ratio of their expenditure in that month is 12: 14: 15. R saved three-eighths of his income that month. Find the ratio of the savings of P and Q that month.**

- [a] 17:15**
- [b] 19:17**
- [c] 21:19**
- [d] 15:13**

## **Solution 8.(d)**

**Let the incomes of P, Q, R be 15X, 16X, 20X respectively.**

**Let the expenditure of P, Q, R be 12Y, 14Y, 15Y respectively.**

**Savings of R = 20X - 15Y =  $\frac{3}{8}(20X)$  (given)**

$$X = \frac{6}{5}Y$$

**Ratio of the savings of P and Q = 15X - 12Y : 16X - 14Y**

$$= 15\left(\frac{6}{5}Y\right) - 12Y : 16\left(\frac{6}{5}Y\right) - 14Y = 15:13$$

# RATIO-PROPORTION

**Q.9) A sum of RS. 3115 is divided among A, B and C, so that if RS. 25, RS. 28 and RS. 52 be diminished from their respective shares, the remainders will be in the ratio 8: 15: 20. Find the shares of each.**

**[a] RS.1452**

**[b] RS.1542**

**[c] RS. 1677**

**[d] RS. 1540**

# RATIO-PROPORTION



**Solution 9.(a)**

**(A's share – 25): (B's share – 28) : (c's share – 52) = 8: 15: 20**

**A's share – 25 / 8 = B's share – 28/ 15 = C's share / 20 = K(say)**

**A's share – 25 = 8K**

**A's share= 8K+25**

**Similarly, B's share = 15K + 28 and C's share = 20K+ 52**

**8K+25 + 15k+28 + 20K+52 = 3115**

**K=70**

**A gets RS. 585, B gets RS. 1078 and C gets RS. 1452**

# RATIO-PROPORTION

**Q.10) A, B and C play cricket. A's runs are to B's runs and B's runs are to C's runs as 3:2 each. Altogether, they score 342 runs. How many runs does each make?**

- [a] 162, 108, 72**
- [b] 182, 100, 89**
- [c] 200, 180, 100**
- [d] 142, 134, 120**

# RATIO-PROPORTION

## Solution 10.(a)

A:	B:	C
3:	2:	
	3:	2

$$A: B: C = 9: 6: 4$$

$$\text{Total R} = 19$$

$$1R = 342/19 = 18$$

$$A\text{'s share} = 18 \times 9 = 162$$

$$B\text{'s share} = 18 \times 6 = 108$$

$$C\text{'s share} = 18 \times 4 = 72$$