Ratio and Proportion

Q.No	Answer
	Type I-Basic
1	Correct Option: B Total No. of boys = 2140 – 1200 = 940 Respective ratio = 940 : 1200 = 47 : 60. Hence, option B is correct.
2	Correct Option: C Let the first number be x and the second number be y Then, 48% of x = 60% of y or, $\frac{x}{y} = \frac{60\%}{48\%} = \frac{5}{4}$ ∴ Reqd ratio = 5 : 4. Hence, option C is correct.
3	**Answer: Option 'D'** **(2a = 6b => a/b = 6/2)** **and (9b = 7c => b/c = 7/9)** **=> a:b = 6:2 and b:c = 7:9** **a:b:c = 42:14:18 = 21:7:9**
4	**Answer: Option 'C'** **a:b = 5 x 5 : 3 x 5 = 25 : 15 b:c = 5 x 3 : 3 x 4 = 15 : 12** **a:b:c = 25 : 15 : 12**
5	**Answer: Option 'B'** **a:b = 1:2, b:c = 3:4, c:d = 2:3** **1:2** **3:4** **(a = 1 × 3 = 3, b = 2 × 3 = 6 and c = 2 × 4 = 8)** **(a = a × b, b= b × b and c= b × c)** **a:b:c = 3:6:8** **a:b:c = 3:6:8 and c:d = 2:3** **(Note: First a,b,c multiplication with c means 2 and last c means 8** **multiplication with d means 3** **a:b:c:d = 6:12:16:24**
6	**Answer: Option 'A'** **a:b = 5x 10 : 3x 10 = 50 : 30** **b:c = 10x 3 : 7x 3 = 30 : 21** **a:b:c = 50 : 30 : 21** **a x 5 : b x 5 : c x 5 = 250 : 150 : 105** **Given, c : d = 5:7** **=> c x 21 : d x 21 = 105:147** **a:b:c:d = 250:150:105:147**
7	**Answer: Option 'B'** **(x x 5) = (0.75 x 8) x = (6/5) = 1.20**
8	**Answer: Option 'B'** **Let the fraction be x. Then,** **x:1/27 = 3/7 : 5/9** **x × 5/9 = 1/27 × 3/7** **x × 5/9 = 1/9 × 1/7** **x × 5/9 = 1/63** **x × 5 = 9/63** **5x = 1/7 = 1/35**
9	**Answer: Option 'C'** **Formula = √a×b** **A = 49 and B = 81** **√49×81 = 7 × 9 = 63**
10	**Answer: Option 'A'** **Let the fourth proportional to 5, 8, 15 be x.** **Then, 5 : 8 : 15 : x => 5x = (8 x 15) x (8x 15) / 5 = 24**

11	**Answer:** B) 2:1 **Explanation:** **Compounded Ratio ::** When we compound two or more ratio's with each other through product or multiplication, the result is simply a compound ratio. Thus, the product of two or more ratios; i.e, **ab:cd** is a ratio compounded of the simple ratios **a:c** and **b:d.** Required compounded ratio = (2/3 **x** 6/11 **x** 11/2) = **2/1.**
12	**Answer:** C) 4 : 6 : 3
13	**Answer:** A) 600 **Explanation:** 1/2:1/3:1/4 = 6:4:3 As the difference is 3 => 3/13x2600 = 600
14	**Answer:** B) Rs. 204 **Explanation:** Given ratio = 1/2:2/3:3/4 = 6:8:9 1st part = 782 x 6/23 = Rs. 204.
15	**Answer:** C) 4:3:2
16	**Answer:** A) 4 : 1
17	**Answer:** B) 11
18	Correct Option: B Sub-duplicate ratio of 16 : 25 is 16 : 25 i.e. 4 : 5. Hence, option B is correct.
19	Answer: D) 7/12 < 5/8 < 3/4 < 13/16 Explanation: 5/8 = .625, 7/12 = .5833, 3/4 = .75, 13/16 = .8125 So order will be 7/12 < 5/8 < 3/4 < 13/16
20	**Answer:** B) 2 and 32
Type II- Equation Based	
1	**Answer:** A) 2890
2	Correct option : (a) Here, A : B : C : D = 1 / 2 : 1 / 4 : 1 / 5 : 1 / 7 **1)** L.C.M of 2, 4, 5, 7 is 140 **2)** Find the number of pens each friend received --------- (To find no. of pens each friend has, multiply the ratio with the L.C.M. calculated) A = (1/2) x 140 = 70 B = (1/4) x 140 = 35 C = (1/5) x 140 = 28 D = (1/7) x 140 = 20 **3)** Total number of pens = (70 x + 35 x + 28 x + 20 x) = 153 x Minimum number of pens (x) = 1 Therefore, total number of pens = 153 pens.
3	**Option B** **Solution:** Ratio 8:11:13 No of men, women and boys are 6, 5, 3 Then ratio of men, women and boys 6*8 : 5*11 : 13*3 =48:55:39 Men part is= (48/142)* 1278 = 432 Then 1 man part= 432/6 =72
4	**Option B** **Solution:** Given C+D= (A+B)/2 B:C 3:1 C:D 3:5 B:C:D 9:3:5 (A+B)=2(C+D) A+9x=2(3x+5x) A=7x.

	Total (7+9+3+5) 24 x=1440==>x=60 Then 7x=7*60==>420
5	**Option C** **Solution:** Let the original number of students be 8x, 9x and 11x (8x + 15)/(9x + 15)=11/12 12(8x+15) =11(9x+15) 96x+180=99x+165 3x=15 x = 5 Required number of students = 8x + 9x + 11x = 28x = 28*5 = 140
6	**Option D** **Solution:** Data Inadequate.
7	**Option D** **Solution:** Let Guna's and Shekar's present age is 6x and 5x respectively. then (6x+12)/(7x+12) = 8/9 54x+108 = 56x + 96 2x = 12 x = 6 Present age of Guna = 6x = 36.
8	**Option C** **Solution:** Let the total population be 'p' Male :Female 7 : 8 Percentage of children among male and female is 25% and 20% Then Adults male and female % = 75% & 80% => 80%(8p/15) = 156800 => 80 x 8p/15 x 100 = 156800 => p = 156800 x 15 x 100/80 x 8 => p = 367500 Therefore, the total population of the city = p = 367500.
9	Answer – **b) decreases 21:20** **Explanation :** Let initial employees be 7x and then 4x similarly initial wages be 3y and then 5y so total wage = 21xy initially and then 20xy so wages decreases and ratio = 21:20
10	**Answer: Option 'A'** **When there are 8 people, the share of each person is 1/8** **When there are 7 people, the share of each person is 1/7** **Increase in the share of each person is 1/7 - 1/8 = 1 / 56 ,** **Which is 1/7 of 1/8 of the original share of each person.**
Type III- Questions on Coins and values	
1	**Answer: Option 'C'** **A:B:C = 3:4:5** **Total parts = 12** **A's share is = 3 parts** **12 -----> Rs.600/-** **3 -----> Rs.150/-** **A's total = 150 + 10 = Rs.160/-**
2	Answer – **d) 280** **Explanation :** Value is given in the ratio 8:4:2. (8x/0.25) + (4x/0.5) + (2x/1) = 840. X = 20. Total amount = 14*20 = 280
3	**D) 40** **Explanation:**

	2x, 4x, 5x (25/100)*2x + (50/100)*4x + 1*5x = 75 x = 10, so 50 p coins = 4x = 40
4	Answer – **C.** **X = 840; Y = 280** **Explanation :** Value is given in the ratio 8:4:2. (8x/0.25) + (4x/0.5) + (2x/1) = 840. X = 20. Total amount, Y = 14*20 = 280
5	Correct option :(c) Let the value of one rupee, 50 paise and 25 paise be 11x, 9x, 5x respectively. No. of 1 rupee coins = (11x / 1) =11x No. of 50 paise coins = (9x / 0.5) = 18x No. of 25 paise coins = (5x / 0.25) = 20x 11x + 18x + 9x = 342 38x = 342 x = 9 Therefore, no. of 1 rupee coins = 11 x 9 = 99 coins No. of 50 paise coins = 18 x 9 = 162 coins No. of 25 paise coins = 20 x 9 = 180 coins
	Type IV – Income and Expenditure
1	Correct option: (a) Suppose income of Puja, Hema and Jaya are Rs A, Rs B and Rs C. Annual income given is Rs 46, 000 If 70 % income is spent by Puja, then that means she saves 30 % (0.3). Similarly, Hema saves 20 % (0.2) and Jaya saves 8 % (0.08) Given ratio of their annual savings are 15 : 11 : 10 $\frac{(0.3A)}{15} = \frac{(0.2B)}{11} = \frac{(0.08C)}{10} = \frac{A}{50} = \frac{B}{55} = \frac{C}{125}$ $= \frac{A}{10} = \frac{B}{11} = \frac{C}{25} = \frac{(A + B + C)}{(10 + 11 + 25)} = \frac{46000}{46}$ ------ (Since, A + B + C = 46000) = 1000 From this equation, we can A = 1000 x 10 = 10,000 B = 1000 x 11 = 11,000 C = 1000 x 25 = 25000
2	Correct option (d) Assume that the daily wages of man, women and daughter are Rs 5x, Rs. 4x, Rs 3x respectively. Multiply (no. of days) with (assumed daily wage) of each person to calculate the value of x. [3 x (5x)] + [2 x (4x)] + [4 x (3x)] = 105 [15x + 8x + 12x] = 105 35x = 105 x = 3 Hence, man's daily wage = 5x = 5 x 3 = Rs. 15 Wife's daily wage = 4x = 4 x 3 = Rs. 12 Daughter's daily wage = 3x = 3 x 3 = Rs. 9
3	Correct option: (d) Toatal bill paid by Amit, Raju and Ram = (50 + 55 +75) = Rs. 180 Let amount paid by Amit, Raju and Ram be Rs. 3x, 4x and 5x respectively. Therefore, (3x + 4x + 5x) = 180 12x = 180 x = 15 Therefore, amount paid by, Amit = Rs. 45

	Raju = Rs. 60 Ram = Rs. 75 But actually as given in the question, Amit pays Rs. 50, Raju pays Rs. 55 and Ram pays Rs. 80. Hence, Amit pays Rs. 5 less than the actual amount to be paid. Hence he needs to pay Rs. 5 to Raju settle the amount.
4	Correct option: (c) Assume original salaries of Ram and Sham as 4x and 5x respectively. Therefore, $\frac{(4x + 5000)}{(5x + 5000)} = \frac{50}{60}$ 60 (4x + 5000) = 50 (5x + 5000) 10 x = 50,000 5x = 25, 000 Sham's present salary = 5x + 5000 = 25,000 + 5000 Sham's present salary = Rs. 30,000
5	Answer – **B.1800** **Explanation :** 4x and 5x is the last year salary of rahul and rohit respectively Rahul last year to rahul current year = 2/3 Rohit last year to rohit current year = 3/5 Current of rahul + current of rohit = 4300 (3/2)*4x + (5/3)*5x = 4300. X = 300. So rahul current salary = 3/2 * 4* 300 = 1800
	Type V – Solution/Mixture Based
1	Answer – **b) 25** **Explanation :** (20 + x)/30 = 3/2
2	**Answer: Option 'B'** **milk: water = 7:3** **7x : 3x + 20 = 7 : 5** **5[7x] = 7[3x + 20]** **35x = 21x + 140** **35x - 21x = 140** **14x = 140** **x = 10** **The quantity of milk in the original mixture is = 7 : 3 = 7 + 3 = 10** **10x = 100** **Short cut method:** **milk: water = 7 : 3** **after adding 20 liters of water** **milk: water = 7 : 5** **milk is same but water increase 20liters then the water ratio is increase 2 parts** **1 part ---> 10 liters** **The quantity of milk in the original mixture is = 7 : 3 = 7 + 3 = 10** **10 parts ---> 100 liters (Answer is = 100)** **Short cut method - 2 : for Only milk problems** **milk : water** **7 : 3** **7 : 5** **milk ratio same but water ratio 2 parts incress per 20 liters** **2 part of ratio ---> 20 liters** **1 part of ratio ---> 10 liters** **10 part of ratio ---> 100 liters**
3	Answer – **A.11:7** **Explanation :** milk = 7/9 and water = 2/9 – in 1st vessel milk = 4/9 and water = 5/9 – in 2nd vessel (7/9 + 4/9)/ (2/9 + 5/9) = 11:7
4	Answer – **b) 32** **Explanation :**

	milk = 4x and water = 3x milk = 4x – 14*4/7 and water = 3x – 14*3/7 + 14 4x – 8: 3x + 8 = 3:4 X = 8, so milk = 8*4 = 32 litres
5	Answer – **b) 56ltr** **Explanation :** Let A = 4x and B = 5x Now, A = 4x – 36*4/9 and B = 5x – 36*5/9 + 36 Now, ratio between A and B = 2:5 X = 11.2 now B = 11.2*5 = 56
6	Answer – **B.151:269** **Explanation :** Milk = 1/4 : 2/5 :3/7 = 35/140 :56/140 : 60/140 Quantity of milk in new mix = 35+56+60 = 151 Quantity of water in new mix = 140*3 = 420-151 = 269 M:W = 151:269
<u>Type VI – Miscellaneous</u>	
1	Answer – **B.16:5** **Explanation :** 6 step fox=3 step horse = 2:1 16 step fox=8step horse=5 step fox 16 step fox=5 step fox 16:5
2	**Answer – B) 2:9** Explanation : 2+9 = 11 66 can divisible by 11.
3	Correct Option: B Let the children be P, Q, R and S and Father be F Chocolates with P : Q : R= 3 : 7 : 11 Let the number of chocolates be 3k, 7k and 11k Total chocolates with three eldest children = 21k Chocolate with F and S = 3 × 21k = 63k Total chocolates = (21k + 63k) = 84k Chocolate with F : (P + Q + R + S) = 3 : 4 Total 7 units of chocolate = 84 k 1 unit = 12k Chocolate with F = 3 × 12k = 36k Chocolate with S = (63k – 36k) = 27k 27 k = 81 → k=3 Total number of chocolates = 84k = 84 × 3 = 252 Hence, option B is correct.
4	**Option D** **Solution:** Let the number of failed students be x Number of passed students = 4x So total number of students was 5x From the given data If total number of students be 5x – 35 (5x-35)/x+9=3/1 x = 31 Total number = 31×5 = 155