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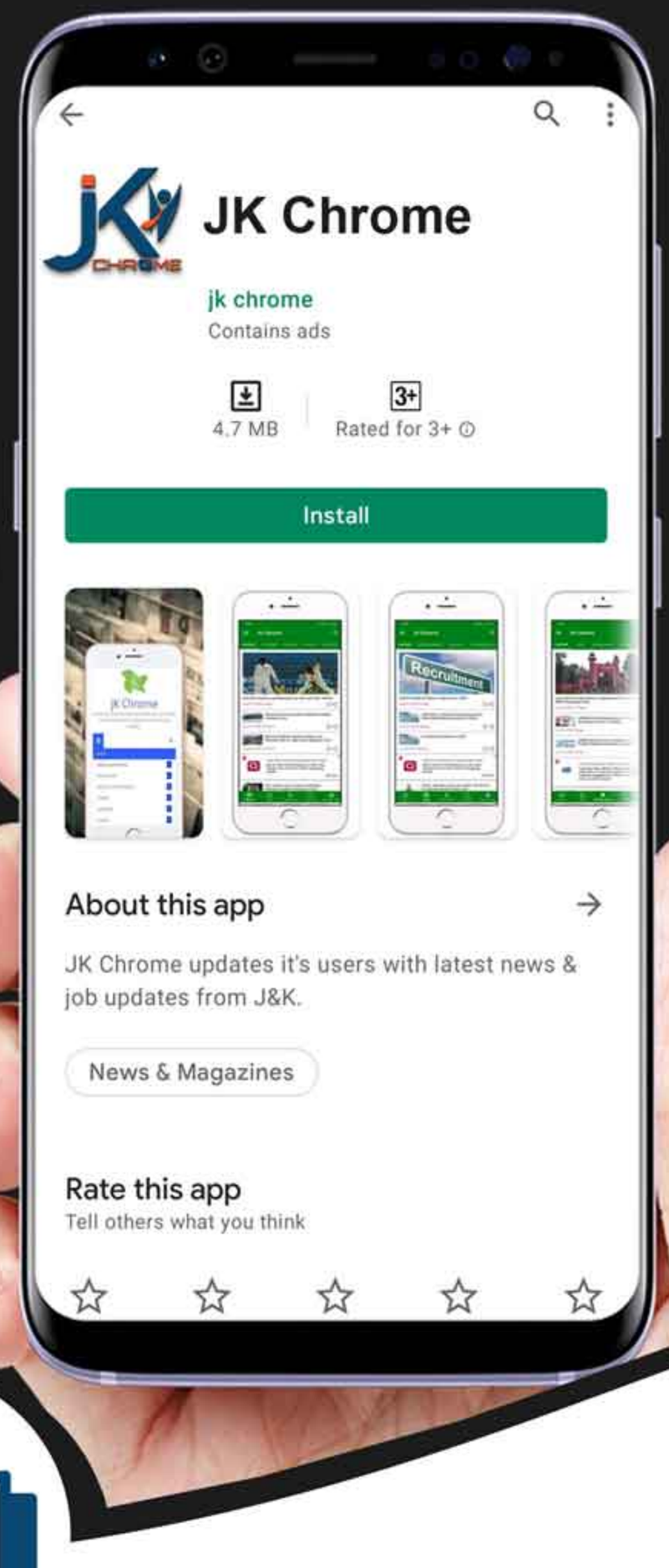

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CHAPTER

8 Ratio, Proportion, Mixture and Partnership

1. A drum of kerosene is $\frac{3}{4}$ full. When 30 litres of kerosene is drawn from it, it remains $\frac{7}{12}$ full. The capacity of the drum is **(SSC CGL 1st Sit. 2010)**

(a) 120 *l* (b) 135 *l* (c) 150 *l* (d) 180 *l*

2. If ` 1000 is divided between A and B in the ratio 3 : 2, then A will receive **(SSC CGL 1st Sit. 2010)**

(a) ` 400 (b) ` 500

(c) ` 600 (d) ` 800

3. What must be added to each term of the ratio 7 : 11, so as to make it equal to 3 : 4 ? **(SSC CGL 1st Sit. 2010)**

(a) 8 (b) 7.5

(c) 6.5 (d) 5

4. Two number are in the ratio 7 : 11. If 7 is added to each of the numbers, the ratio becomes 2 : 3. The smaller number is **(SSC CGL 2nd Sit. 2010)**

(a) 39 (b) 49 (c) 66 (d) 77

5. If 1.5a = 0.04 b, then $\frac{b-a}{b+a}$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) $\frac{73}{77}$ (b) $\frac{77}{33}$ (c) $\frac{2}{75}$ (d) $\frac{75}{2}$

6. The ratio of milk and water in mixtures of four containers are 5 : 3, 2 : 1, 3 : 2 and 7 : 4 respectively, in which container is the quantity of milk, relative to water, minimum ? **(SSC CGL 2nd Sit. 2010)**

(a) First (b) Second

(c) Third (d) Fourth

7. Two numbers are in the ratio 1 : 3. If their sum is 240, then their difference is **(SSC CGL 2nd Sit. 2010)**

(a) 120 (b) 108

(c) 100 (d) 96

8. The ratio of income and expenditure of a person is 11 : 10. If he saves ` 9,000 per annum, his monthly income is **(SSC CGL 2nd Sit. 2010)**

(a) ` 8,000 (b) ` 8,800 (c) ` 8,500 (d) ` 8,250

9. If $W_1 : W_2 = 2 : 3$ and $W_1 : W_3 = 1 : 2$ then $W_2 : W_3$ is **(SSC CGL 2nd Sit. 2010)**

(a) 3 : 4 (b) 4 : 3 (c) 2 : 3 (d) 4 : 5

10. In a business partnership among A, B, C and D, the profit is shared as follows:

$$\frac{\text{A's share}}{\text{B's share}} = \frac{\text{B's share}}{\text{C's share}} = \frac{\text{C's share}}{\text{D's share}} = \frac{1}{3}$$

If the total profit is ` 4,00,000, the share of C is **(SSC CGL 1st Sit. 2011)**

(a) ` 1,12,500 (b) ` 1,37,500

(c) ` 90,000 (d) ` 2,70,000

11. A can contains a mixture of two liquids A and B in the ratio 7 : 5. When 9 litres of mixture are drawn off and the can is filled with B, the ratio of A and B becomes 7 : 9. Litres of liquid A contained by the can initially was **(SSC CGL 1st Sit. 2011)**

(a) 10 (b) 20

(c) 21 (d) 25

12. What number should be added to or subtracted from each term of the ratio 17 : 24 so that it becomes equal to 1 : 2? **(SSC CGL 1st Sit. 2011)**

(a) 5 is subtracted (b) 10 is added

(c) 7 is added (d) 10 is subtracted

13. The ratio of weekly incomes of A and B is 9 : 7 and the ratio of their expenditures is 4 : 3. If each saves ` 200 per week, then the sum of their weekly incomes is **(SSC CGL 1st Sit. 2011)**

(a) ` 3,600 (b) ` 3,200

(c) ` 4,800 (d) ` 5,600

14. Among three numbers, the first is twice the second and thrice the third. If the average of the three numbers is 49.5, then the difference between the first and the third number is **(SSC CGL 2nd Sit. 2011)**

(a) 54 (b) 28 (c) 39.5 (d) 41.5

15. If $x : y = 4 : 5$, then $(3x + y) : (5x + 3y) =$ **(SSC CGL 2nd Sit. 2011)**

(a) 3 : 5 (b) 5 : 3 (c) 17 : 35 (d) 35 : 17

16. The ratio of the quantities of an acid and water in a mixture is 1 : 3. If 5 litres of acid is further added to the mixture, the new ratio becomes 1 : 2. The quantity of new mixture in litres is **(SSC CGL 2nd Sit. 2011)**

(a) 32 (b) 40 (c) 42 (d) 45

17. The ratio between two numbers is 2 : 3. If each number is increased by 4, the ratio between them becomes 5 : 7. The difference between the numbers is **(SSC CGL 2nd Sit. 2011)**

(a) 8 (b) 6 (c) 4 (d) 2

18. Monthly incomes of A and B are in the ratio of 4 : 3 and their expenses bear the ratio 3 : 2. Each of them saves ` 6,000 at the end of the month, then the monthly income of A is **(SSC CGL 2nd Sit. 2011)**

(a) ` 12,000 (b) ` 24,000
(c) ` 30,000 (d) ` 60,000

19. Equal amounts of water were poured into two empty jars of different capacities, which made one jar $\frac{1}{4}$ full and the other jar $\frac{1}{3}$ full. If the water in the jar with lesser capacity is then poured into the jar with greater capacity, then the part of the larger jar filled with water is **(SSC Sub. Ins. 2012)**

(a) $\frac{1}{2}$ (b) $\frac{7}{12}$ (c) $\frac{1}{4}$ (d) $\frac{1}{3}$

20. A certain sum of money is distributed to A and B in the ratio 2 : 5. If A received ` 100, then the money received by B is **(SSC Sub. Ins. 2012)**

(a) ` 200 (b) ` 150
(c) ` 250 (d) ` 300

21. A man leaves ` 12,600 to be divided among 7 sons, 3 daughters and 5 nephews. If each daughter receives three times as much as each nephew and each son receives seven times as much as each nephew, then each daughter's share is **(SSC Sub. Ins. 2012)**

(a) ` 700 (b) ` 650 (c) ` 600 (d) ` 750

22. In a school, the ratio of boys to girls is 4 : 3 and the ratio of girls to teachers is 8 : 1. The ratio of student to teachers is : **(SSC CHSL 2012)**

(a) 56 : 3 (b) 55 : 1 (c) 49 : 3 (d) 56 : 1

23. A, B and C are batsmen. The ratio of the runs scored by them in a certain match are given below:
A : B = 5 : 3 and B : C = 4 : 5. In all they scored 564 runs. The number of runs scored by B is: **(SSC CHSL 2012)**

(a) 124 (b) 104 (c) 114 (d) 144

24. The ratio in which a man must mix rice at ` 10.20 per kg and ` 14.40 per kg so as to make a mixture worth ` 12.60 per kg, is **(SSC Multi-Tasking 2013)**

(a) 3 : 4 (b) 4 : 3 (c) 2 : 5 (d) 18 : 24

25. The cost of a piece of diamond varies with the square of its weight. A diamond of ` 5,184 value is cut into 3 pieces whose weights are in the ratio 1 : 2 : 3. Find the loss involved in the cutting. **(SSC CGL 1st Sit. 2012)**

(a) `3,068 (b) `3,088 (c) `3,175 (d) `3,168

26. In a partnership business, A invests $\frac{1}{6}$th of the capital for $\frac{1}{6}$ of the total time, B invests $\frac{1}{4}$ of the capital for $\frac{1}{4}$ of the total time and C, the rest of the capital for the whole time. Out of a profit of ` 19,400, B's share is: **(SSC CGL 2nd Sit. 2012)**

(a) ` 2000 (b) ` 1200 (c) ` 1600 (d) ` 1800

27. A jar contains a mixture of two liquids A and B in the ratio 4 : 1. When 10 litre of the mixture is replaced with liquid B, the ratio becomes 2 : 3. The volume of liquid A present in the jar earlier was: **(SSC CGL2nd Sit. 2012)**

(a) 20 ltr (b) 10 ltr (c) 16 ltr (d) 15 ltr

28. A and B are partners in a business. A contributes $\frac{1}{4}$ of the capital for 15 months and B received $\frac{2}{3}$ of the profit. Find for how long B's money was used? **(SSC CGL 1st Sit. 2012)**

(a) 6 months (b) 8 months
(c) 10 months (d) 12 months

29. An employer reduces the number of employees in the ratio 8: 5 and increases their wages in the ratio 7:9. As a result, the overall wages bill is **(SSC CGL 1st Sit. 2012)**

(a) Increased in the ratio 56 : 69
(b) Decreased in the ratio 56 : 45
(c) Increased in the ratio 13 : 17
(d) Decreased in the ratio 17 : 13

30. *A*, *B*, *C* subscribe together ` 50,000 for a business. *A* subscribes ` 4,000 more than *B* and *B* ` 5,000 more than *C*. Out of a total profit of ` 35,000, *A* receives **(SSC CGL 2nd Sit. 2012)**

(a) ` 8,500 (b) ` 11,998 (c) ` 12,600 (d) ` 14,700

31. 465 coins consists of 1 rupee, 50 paise and 25 paise coins. Their values are in the ratio 5: 3 : 1. The number of each type of coins respectively is **(SSC CGL 2nd Sit. 2012)**

(a) 155, 186, 124 (b) 154, 187, 124
(c) 154, 185, 126 (d) 150, 140, 175

32. The present ages of two persons are 36 and 50 years respectively, if after *n* years the ratio of their ages will be 3 : 4, then the value of *n* is **(SSC Multi-Tasking 2013)**

(a) 3 (b) 4 (c) 7 (d) 6

33. A man ordered 4 pairs of black socks and some pairs of brown socks. The price of a black socks is double that of a brown pair. While preparing the bill the clerk interchanged the number of black and brown pairs by mistake which increased the bill by 50%. The ratio of the number of black and brown pairs of socks in the original order was : **(SSC Sub. Ins. 2013)**

(a) 2 : 1 (b) 1 : 4 (c) 1 : 2 (d) 4 : 1

34. The proportion of acid and water in three samples is 2 : 1, 3 : 2 and 5 : 3. A mixture containing equal quantities of all three samples is made. The ratio of water and acid in the mixture is: **(SSC Sub. Ins. 2013)**

(a) 120 : 133 (b) 227 : 133
(c) 227 : 120 (d) 133 : 227

35. The ratio of age of two boys is 5 : 6. After two years, the ratio will be 7 : 8. The ratio of their ages after 12 years will be **(SSC CHSL 1st Sit. 2013)**

(a) 11/12 (b) 22/24 (c) 15/16 (d) 17/18

36. A invests ` 64,000 in a business. After few months, B joined him with ` 48,000. At the end of year, the total profit was divided between them in the ratio 2 : 1. After how many months did B join ? **(SSC CHSL 2nd Sit. 2013)**

(a) 7 (b) 8 (c) 4 (d) 6

37. Three numbers are in the ratio 1 : 2 : 3. By adding 5 to each of them, the new numbers are in the ratio 2 : 3 : 4. The numbers are : **(SSC CGL 1st Sit. 2013)**

(a) 5, 10, 15 (b) 10, 20, 30

(c) 15, 30, 45 (d) 1, 2, 3

38. ` 700 is divided among A, B, C in such a way that the ratio of the amount of A and B is 2 : 3 and that of B and C is 4 : 5. Find the amounts in ` each received, in the order A, B, C. **(SSC CGL 2nd Sit. 2013)**

(a) 150, 250, 300 (b) 160, 240, 300

(c) 150, 250, 290 (d) 150, 240, 310

39. The ratio of monthly incomes of A, B is 6 : 5 and their monthly expenditures are in the ratio 4 : 3. If each of them saves ` 400 per month, find the sum of their monthly incomes. **(SSC CGL 2nd Sit. 2013)**

(a) ` 2300 (b) ` 2400 (c) ` 2200 (d) ` 2500

40. A and B have together three times what B and C have, while A, B, C together have thirty rupees more than that of A. If B has 5 times that of C, then A has **(SSC CGL 2nd Sit. 2013)**

(a) ` 60 (b) ` 65 (c) ` 75 (d) ` 45

41. 15 litres of a mixture contains alcohol and water in the ratio 1 : 4. If 3 litres of water is mixed in it, the percentage of alcohol in the new mixture will be **(SSC CGL 2nd Sit. 2013)**

(a) 15 (b) $16\frac{2}{3}$ (c) 17 (d) $18\frac{1}{2}$

42. The prices of a school bag and a shoe are in the ratio 7 : 5. The price of a school bag is ` 200 more than the price of a shoe. Then the price of a shoe is **(SSC CGL 1st Sit. 2013)**

(a) ` 500 (b) ` 1,200 (c) ` 200 (d) ` 700

43. A sum of ` 300 is divided among P, Q and R in such a way that Q gets ` 30 more than P and R gets ` 60 more than Q. The ratio of their share is **(SSC CGL 1st Sit. 2013)**

(a) 3 : 2 : 5 (b) 2 : 5 : 3

(c) 5 : 3 : 2 (d) 2 : 3 : 5

44. The prize money of ` 1,800 is divided among 3 students A, B and C in such a way that 4 times the share of A is equal to 6 times the share of B, which is equal to 3 times the share of C. Then A's share is **(SSC CGL 1st Sit. 2013)**

(a) ` 400 (b) ` 600

(c) ` 700 (d) ` 800

45. Divide 81 into three parts so that $\frac{1}{2}$ of 1st, $\frac{1}{3}$ of 2nd and $\frac{1}{4}$ of 3rd are equal. **(SSC CGL 1st Sit. 2013)**

(a) 36, 27, 18 (b) 27, 18, 36

(c) 18, 27, 36 (d) 30, 27, 24

46. The ratio of $25^{2.5} : 5^3$ is same as **(SSC CGL 1st Sit. 2013)**

(a) 5 : 3 (b) 5 : 6 (c) 1 : 25 (d) 25 : 1

47. If 2x = 3y = 4z, find x : y : z. **(SSC Multi-Tasking 2014)**

(a) 3 : 4 : 6 (b) 6 : 4 : 3

(c) 4 : 3 : 2 (d) 2 : 3 : 4

48. The ratio of the ages of A, B and C is 5 : 8 : 9. If the sum of the ages of A and C is 56 years, the age of B will be **(SSC Multi-Tasking 2014)**

(a) 12 years (b) 23 years

(c) 21 years (d) 32 years

49. A box contain 280 coins of one rupee, 50 paise and 25 paise. The values of each kind of coin are in the ratio of 8 : 4 : 3. The number of one rupee coins will be **(SSC Multi-Tasking 2014)**

(a) 52 (b) 81 (c) 60 (d) 80

50. If x : y ::2 : 3 and 2 : x :: 4 : 8, then the value of y is **(SSC Sub. Ins. 2014)**

(a) 6 (b) 8 (c) 4 (d) 12

51. ` 730 were divided among A, B, C in such a way that if A gets ` 3, then B gets ` 4 and if B gets ` 3.50 then C gets ` 3. The share of B exceeds that of C by **(SSC Sub. Ins. 2014)**

(a) ` 30 (b) ` 40 (c) ` 70 (d) ` 210

52. If $\frac{x}{y}=\frac{4}{5}$, then the value of $\left(\frac{4}{7}+\frac{2y-x}{2y+x}\right)$ is **(SSC CHSL 1st Sit. 2014)**

(a) $\frac{3}{7}$ (b) $1\frac{1}{7}$ (c) 1 (d) 2

53. Two numbers are in the ratio 3 : 5. If 9 is subtracted from each, the new numbers are in the ratio 12 : 23. The small number is **(SSC CHSL 2nd Sit. 2014)**

(a) 27 (b) 33 (c) 49 (d) 55

54. If x : y = 5 : 2, then (8x + 9y) : (8x + 2y) is **(SSC CHSL 2nd Sit. 2014)**

(a) 22 : 29 (b) 26 : 61 (c) 29 : 22 (d) 61 : 26

55. Gold is 19 times as heavy as water and copper is 9 times as heavy as water. In what ratio should these be mixed to get an alloy 15 times as heavy as water? **(SSC CGL 1st Sit. 2014)**

(a) 1 : 1 (b) 1 : 2 (c) 2 : 3 (d) 3 : 2

56. Incomes of x and y are in the ratio 4 : 3. Their expenditures are in the ratio 12 : 7. Both save ` 3200 at the end of the month, then the income of x is : **(SSC Sub. Ins. 2015)**

(a) ` 6000 (b) ` 8000

(c) ` 2000 (d) ` 4000

57. The current ages of Sonali and Monali are in the ratio 5 : 3. Five years from now, their ages will be in the ratio 10 : 7. Then, Monali's current age is: **(SSC CHSL 1st Sit. 2015)**

(a) 9 years (b) 15 years

(c) 3 years (d) 5 years

58. A vessel contains 60 litres of milk. 12 litres of milk taken out from it and replaced by water. Then again from mixture, 12 litres are again taken out and replaced by water. The ratio of milk and water in the resultant mixture is : **(SSC CHSL 1st Sit. 2015)**

(a) 16 : 10 (b) 9 : 5

(c) 15 : 10 (d) 16 : 9

59. Eighteen years ago, the ratio of A's age to B's age was 8 : 13. Their present age ratio's are 5 : 7. What is the present age of A? **(SSC CGL 1st Sit. 2015)**

(a) 70 years (b) 50 years

(c) 40 years (d) 60 years

60. 729 ml of a mixture contains milk and water in the ratio 7 : 2. How much more water is to be added to get a new mixture containing milk and water in the ratio 7 : 3 ?

(SSC CGL 1st Sit. 2015)

(a) 60 ml (b) 71 ml (c) 52 ml (d) 81 ml

61. What must be added to each term of the ratio 2 : 5 so that it may equal to 5 : 6 ? **(SSC CGL 1st Sit. 2015)**

(a) 12 (b) 78 (c) 65 (d) 13

62. If A and B are in the ratio 4 : 5 and the difference of their squares is 81, what is the value of A?

(SSC CGL 1st Sit. 2015)

(a) 36 (b) 15 (c) 45 (d) 12

63. The ratio of number of boys and girls in a school of 720 students is 7 : 5 . How many more girls should be admitted to make the ratio 1 : 1 ? **(SSC CGL 1st Sit. 2016)**

(a) 90 (b) 120 (c) 220 (d) 240

64. A and B invest ` 3000 and ` 2400 respectively in a business. If, after one year, there is a loss of ` 720, how much loss will B bear? (Loss or Profit is in proportion to their investments)

(SSC CGL 1st Sit. 2016)

(a) ` 72 (b) ` 320 (c) ` 400 (d) ` 360

65. The numbers x, y, z are respectively proportional to 2, 3, 5 and the sum of x, y and z is 80. If the number z is given by the equation $z = ax - 8$, then a is **(SSC CGL 1st Sit. 2016)**

(a) 6 (b) 3/2 (c) 3 (d) 5/2

66. The sum of the cubes of two numbers in the ratio 3 : 4 is 5824. The sum of the numbers is: **(SSC CGL 1st Sit. 2016)**

(a) $(5824)^{1/3}$ (b) 28 (c) 24 (d) 14

67. A can is full of a mixture of a two liquids A and B in the ratio of 7:5. When 9 litres of mixture are drawn off from the can and replaced by the same quantity of liquid B, the ratio of A and B in the can becomes 7:9. The capacity of the can initially was **(SSC Sub. Ins. 2016)**

(a) 10 litres (b) 21 litres (c) 20 litres (d) 36 litres

68. The ratio of the radii of two cylinders is 2:1 and their heights are in the ratio 3:2. Then their volumes are in the ratio

(SSC Sub. Ins. 2016)

(a) 3 : 1 (b) 4 : 3 (c) 6 : 5 (d) 6 : 1

69. If $\frac{3}{7}P = \frac{4}{11}Q$, then what is the ratio of P and Q respectively?

(SSC CGL 2017)

(a) 12 : 77 (b) 12 : 33 (c) 28 : 33 (d) 3 : 28

70. ` 3200 is divided among A, B and C in the ratio of 3 : 5 : 8 respectively. What is the difference (in `) between the share of B and C? **(SSC CGL 2017)**

(a) 400 (b) 600 (c) 800 (d) 900

71. A, B and C invested amounts in the ratio 3 : 4 : 5 respectively. It the schemes offered compound interest at the rate of 20% per annum, 15% per annum and 10% per annum respectively, then what will be the ratio of their amounts after 1 year? **(SSC CGL 2017)**

(a) 3 : 15 : 25 (b) 6 : 6 : 5

(c) 36 : 46 : 55 (d) 12 : 23 : 11

72. If A : B = 2 : 5, B : C = 4 : 3 and C : D = 2 : 1, then what is value of A : C : D? **(SSC CGL 2017)**

(a) 6 : 5 : 2 (b) 7 : 20 : 10

(c) 8 : 30 : 15 (d) 16 : 30 : 15

73. The third proportional of two numbers 9 and 24 is

(SSC CHSL 2017)

(a) 39 (b) 48 (c) 72 (d) 64

74. The sum of the present ages of father and son is 90 years. 10 years earlier the ratio of their ages was 5 : 2. The present age of the father is: **(SSC MTS 2017)**

(a) 65 (b) 68 (c) 70 (d) 60

75. 1/2 of A = 2/5 of B = 1/3 of C, then A : B : C is:

(SSC MTS 2017)

(a) 4 : 6 : 5 (b) 6 : 4 : 5 (c) 4 : 5 : 6 (d) 5 : 4 : 6

76. Of the three numbers, the first is twice the second, and the second is twice the third. The average of the reciprocal of the numbers is 7/12. The numbers are: **(SSC MTS 2017)**

(a) 20, 10, 5 (b) 4, 2, 1 (c) 36, 18, 9 (d) 16, 8, 4

77. A litre of water weighs a kilogram, a litre of another liquid weighs 1.340 kilograms. A mixture of the two weighs 1.270 kilograms per litre. The ratio of their volumes in a litre of the mixture is: **(SSC MTS 2017)**

(a) 27 : 34 (b) 7 : 27 (c) 17 : 24 (d) 7 : 17

78. If 2A = 3B and 3B = 2C, then what is A : B : C?

(SSC Sub. Ins. 2017)

(a) 3 : 2 : 3 (b) 2 : 3 : 2 (c) 1 : 3 : 1 (d) 2 : 3 : 4

79. Raman, Manan, and Kamal are partners and invest in a business such that Raman invests 2/5th of total and Manan invest 3/8th of the total. What is the ratio of profit of Raman, Manan and Kamal respectively? **(SSC Sub. Ins. 2017)**

(a) 16 : 15 : 9 (b) 16 : 15 : 31

(c) 2 : 3 : 5 (d) 15 : 16 : 9

80. What is the ratio of the mean proportional between 8.1 and 3.6 and the third proportional of 2 and 3?

(SSC Sub-Inspector-2018)

(a) 5:6 (b) 5 : 4 (c) 6:5 (d) 4 : 5

81. A milkman uses three containers for selling milk, their capacities being 40 L, 30 L and 20 L respectively. He fills respectively 87.5% , 80% and 90% of the containers with a mix of milk and water in the ratios, 3 : 2, : 5 : 1 and 7 : 2 respectively. What is the ratio of the total quantity of milk to that of water carried by him? **(SSC CHSL-2018)**

(a) 7 : 2 (b) 31 : 12 (c) 35 : 9 (d) 5 : 2

82. The ratio of the number of boys to the number of girls in a school of 640 students, is 5 : 3. If 30 more girls are admitted in the school, then how many more boys should be admitted so that the ratio of boys to that of the girls, becomes 14 : 9. **(SSC CGL 2019-20)**

(a) 15 (b) 30 (c) 20 (d) 25

83. The ratio of monthly incomes of Pawan and Sunil is 4 : 3 and the ratio of their monthly expenditures is 3 : 2. If Pawan and Sunil save ` 4000 and ` 6000 respectively per month, then what is the sum of their monthly incomes?
(SSC MTS 2019-20)
(a) ` 60000 (b) ` 70000 (c) ` 50000 (d) ` 36000

84. ` 3,600 is divided between Seema, Komal and Rita, such that the ratios of the shares of Seema : Komal = 1.5 : 2 and Komal : Rita = 2 : 2.5. Find Rita's share. **(SSC CHSL 2019-20)**
(a) ` 1,400 (b) ` 1,200 (c) ` 1,300 (d) ` 1,500

85. A, B and C divide a certain sum of money among themselves. The average of the amounts with them is ` 4520. Share of A is $10\frac{2}{3}$% more than share of B and $33\frac{1}{3}$% less than share of C. What is theshare of B (in `)? **(SSC CGL 2020-21)**
(a) 3500 (b) 3600 (c) 3984 (d) 5976

86. Atul purchased Bread costing ` 20 and gave a 100 rupee note to the shopkeeper. The shopkeeper gave the balance money in coins of denomination ` 2, ` 5 and ` 10. If these coins are in the ratio 5 : 4 : 1, then how many ` 5 coins did the shopkeeper give? **(SSC CGL 2020-21)**
(a) 6 (b) 5 (c) 4 (d) 8

87. Two number A and B are in the ratio 13 : 17. If A is increased by 15% and B is increased by 30%, then the new ratio of A and B will be: **(SSC CHSL 2020-21)**
(a) 23 : 34 (b) 23 : 33 (c) 21 : 29 (d) 21 : 31

88. In an examination, the ratio of the number of candidates who passed to those who failed was 5 : 2. If the number of failed candidates had been 14 more, then the ratio of the number of passed candidates to those who failed would have been 4 : 3. The number of candidates who appeared in the examination was: **(SSC MTS 2020-21)**
(a) 70 (b) 100 (c) 98 (d) 126

89. The ratio of the income of A and B is 1 : 2 and that of their expenditure is 2 : 3. If 80% of B's expenditure is equal to the income of A, then what is the ratio of the savings of A and B ?
(SSC MTS 2020-21)
(a) 7 : 3 (b) 2 : 9 (c) 9 : 2 (d) 3 : 7

90. A person was standing on a road near a mall. He was 1425m away from the mall and able to see the top of the mall from the road in such a way that the top of a tree, which is in between him and the mall, was exactly in line of sight with the top of the mall. The tree height is 10 m and it is 30 m away from him. How tall (in m) is the mall?
(SSC Sub-Inspector 2020-21)
(a) 475 (b) 300 (c) 425 (d) 525

91. Seven years ago, the ratio of the ages of A and B was 4 : 5. Eight years hence, the ratio of the ages of A and B will be 9 : 10. What is the sum of their present ages in years?
(SSC Sub-Inspector 2020-21)
(a) 32 (b) 82 (c) 41 (d) 56

92. A, B and C started a business by investing ` 13,750, ` 16,250 and ` 18,750, respectively. If B's share in the profit earned by them is ` 5,200. What is the total profit (in `) earned by them together?
(SSC Sub-Inspector 2020-21)
(a) 18,200 (b) 17,500 (c) 15,600 (d) 16,600

HINTS & EXPLANATIONS

1. (d) Let the capacity of the drum be x litres.

$$\therefore \frac{3x}{4} - 30 = \frac{7x}{12}$$

$$\Rightarrow \frac{3x}{4} - \frac{7x}{12} = 30$$

$$\Rightarrow \frac{9x - 7x}{12} = 30$$

$$\Rightarrow \frac{x}{6} = 30 \Rightarrow x = 6 \times 30 = 180 \text{ litres}$$

2. (c) A's share

$$= ` \left(\frac{3}{5} \times 1000\right) = ` 600$$

3. (d) Let the required number be x.

$$\therefore \frac{7+x}{11+x} = \frac{3}{4}$$
$$\Rightarrow 28 + 4x = 33 + 3x$$
$$\Rightarrow x = 33 - 28 = 5$$

4. (b) Let the numbers be 7x and 11x respectively.

$$\therefore \frac{7x+7}{11x+7} = \frac{2}{3}$$
$$\therefore 22x + 14 = 21x + 21$$
$$\Rightarrow x = 7$$
$$\therefore \text{Smaller number} = 7x = 7 \times 7 = 49$$

5. (a) $1.5a = 0.04\,b$

$$\frac{b}{a} = \frac{1.5}{0.04}$$

By componendo and dividendo,

$$\frac{b-a}{b+a} = \frac{1.5 - 0.04}{1.5 + 0.04} = \frac{1.46}{1.54} = \frac{73}{77}$$

6. (c) Milk in $V_1 = \frac{5}{8} = 0.625$

Milk in $V_2 = \frac{2}{3} = 0.66$

Milk in $V_3 = \frac{3}{5} = 0.6$

Milk in $V_4 = \frac{7}{11} = 0.636$

7. (a) Let the numbers be 3x and x.

$3x + x = 240$

$\Rightarrow 4x = 240$

$\Rightarrow x = \frac{240}{4} = 60$

$\therefore$ Difference $= 3x - x = 2x = 2 \times 60 = 120$

8. (d) Let the income of man be ` 11x and his expenditure be ` 10x.

$\therefore$ Savings x = ` 9000

$\therefore$ Monthly income of man $= \frac{11 \times 9000}{12} =$ ` 8250

Since income = 11x

expenditure = 10x

Saving = 11x – 10x = x

x = 9000

Monthly income $= \frac{11x}{12} = \frac{11 \times 9000}{12} =$ ` 8,250

9. (a) $\frac{W_1}{W_2} = \frac{2}{3}$

$\Rightarrow \frac{W_2}{W_1} = \frac{3}{2}$ and $\frac{W_1}{W_3} = \frac{1}{2}$

$\therefore \frac{W_2}{W_1} \times \frac{W_1}{W_3} = \frac{W_2}{W_3} = \frac{3}{2} \times \frac{1}{2} = \frac{3}{4}$

10. (c) A : B = 1 : 3

B : C = 1 : 3 = 3 : 9

C : D = 1 : 3 = 9 : 27

$\therefore$ A : B : C : D = 1 : 3 : 9 : 27

Sum of ratios = 1 + 3 + 9 + 27 = 40

$\therefore$ C's share of profit

$= \frac{9}{40} \times 400000 =$ ` 90000

11. (c) A = 7x litre, B = 5x litre (let)

In 9 litres of mixture,

A $= \frac{7x}{12x} \times 9 = \frac{21}{4}$ litre

B $= \frac{5x}{12x} \times 9 = \frac{15}{4}$ litre

In new situation, $\frac{7x - \frac{21}{4}}{5x - \frac{15}{4} + 9} = \frac{7}{9}$

$\Rightarrow \frac{28x - 21}{20x - 15 + 36} = \frac{7}{9}$

$\Rightarrow 252x - 189 = 140x + 147$

$\Rightarrow 112x = 336 \Rightarrow x = 3$

$\therefore$ Initial quantity of liquid A

$= 7x = 7 \times 3 = 21$ litre

12. (d) Let the number x be added

$\therefore \frac{17 + x}{24 + x} = \frac{1}{2}$

$\Rightarrow 34 + 2x = 24 + x$

$\Rightarrow 2x - x = 24 - 34$

$\Rightarrow x = -10$

Hence, 10 should be subtracted.

13. (b) Let monthly income of A and B be 9x and 7x

Expenditure = Income – Saving

ATQ

$\frac{9x - 200}{7x - 200} = \frac{4}{3}$

$\Rightarrow 27x - 6.00 = 28x - 800$

$\Rightarrow x = 200$

$\therefore$ Sum $= 200 \times 16 =$ ` 3200

14. (a) Let the second number be x.

$\therefore$ First number = 2x

$\therefore$ Third number $= \frac{2x}{3}$

$\therefore 2x + x + \frac{2x}{3} = 49.5 \times 3$

$\Rightarrow 6x + 3x + 2x = 49.5 \times 9 = 445.5$

$\Rightarrow 11x = 445.5 \Rightarrow x = \frac{445.5}{11} = 40.5$

$\therefore$ Requried difference

$= 2x - \frac{2x}{3} = \frac{4x}{3}$

$= \frac{4 \times 40.5}{3} = 54$

15. (c) $\frac{x}{y} = \frac{4}{5}$

$\therefore \frac{3x + y}{5x + 3y} = \frac{3\left(\frac{x}{y}\right) + 1}{5\left(\frac{x}{y}\right) + 3}$

$= \frac{3 \times \frac{4}{5} + 1}{5 \times \frac{4}{5} + 3} = \frac{\frac{12 + 5}{5}}{7} = \frac{17}{35}$

16. (d) Let the quantity of acid in original mixture be x litre and that of water be 3x litre.

$\therefore \frac{x + 5}{3x} = \frac{1}{2}$

$\Rightarrow 2x + 10 = 3x \Rightarrow x = 10$

$\therefore$ Quantity of new mixture

$= 4x + 5 = 45$ litres

17. (a) Let the numbers be 2x and 3x.

$$\therefore \frac{2x+4}{3x+4}=\frac{5}{7}$$

$\therefore 15x+20=14x+28$

$\Rightarrow x=28-20=8=$ Required Difference

18. (b) Let salary of A and B be 4x and 3x

expenditure = income-saving

ATQ

$$\frac{4x-6000}{3x-6000}=\frac{3}{2}$$

$\Rightarrow 8x-12000=9x-18000$

$\Rightarrow x=6000$

$\therefore$ A's salary $=4x=4\times 6000=$ ` 24000

19. (a) Amounts of water in two jars are equal; the jar with the greater capacity is $\frac{1}{4}$ full, and the jar with lesser capacity is $\frac{1}{3}$ full.

$\therefore$ When the water in smaller jar is poured into the larger jar, the addition of an equal amount of water will double the amount in the larger jar, which will then be $2\times\frac{1}{4}$

$=\frac{1}{2}$ full.

20. (c) Let 'x' be the total sum of money.

Money received by A $=\frac{2}{7}\times x$

$\Rightarrow 100=\frac{2}{7}\times x \Rightarrow x=$ ` 350

$\therefore$ Money received by B $=\frac{5}{7}\times 350=$ ` 250

21. (c) $7S+3D+5N=$ ` 12600 ...(1)

According to Question,

$D=3N$

$S=7N$

Putting these values in equation (1)

$49N+9N+5N=12600$

$\Rightarrow 63N=12600$

$\Rightarrow N=200$

Each daughter's share

$=3\times$ Nephew's share $=3\times 200=$ ` 600

22. (a)

boys	:	girls	girls	:	teacher
4	:	3	8	:	1

So,

boys	:	girls	:	teacher
4	:	3		
		8	:	1
32	:	24	:	3

So, Student : teacher

$\Rightarrow$ (boys + girls) : teacher

(32 + 24) : 3

56 : 3

23. (d) A : B = 5 : 3

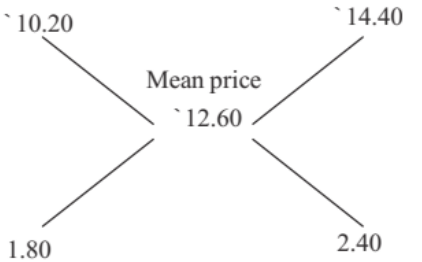
B : C = 4 : 5

A	:	B	:	C
5	:	3		
		4	:	5
20	:	12	:	15

No. of runs scored by B $=\frac{12}{47}\times 564=144$

24. (a) By the rule of alligation:

Cost of 1 kg rice of 1st kind Cost of 1 kg rice of 2nd kind



$\therefore$ Required ratio = 1.80 : 2.40 = 3 : 4.

25. (d) If the weight of a piece of diamond be 6 x units, then

Original price $k(6x)^2=36kx^2$

$\therefore 36kx^2=5184$ .....(i)

Again,

New price $=k(x^2+4x^2+9x^2)=14kx^2$

$=\frac{14\times 5184}{36}=$ ` 2016

$\therefore$ Loss $=5184-2016$

$=$ ` 3168

26. (d) Ratio of profit sharing

$=\frac{1}{6}\times\frac{1}{6}:\frac{1}{4}\times\frac{1}{4}:\frac{7}{12}\times 1=\frac{1}{36}:\frac{1}{16}:\frac{7}{12}$

$=\frac{1}{36}\times 144:\frac{1}{16}\times 144:\frac{7}{12}\times 144=4:9:84$

Sum of ratios = 97

$\therefore$ B's share $=\frac{9}{97}\times 19400=$ ` 1800

27. (c) Liquid A = 4x litre

Liquid B = x litre

In 10 litres of mixture,

Liquid A $=\frac{4}{5}\times 10=8$ litre

Liquid B = 2 litre

$$\therefore \frac{4x-8}{x-2+10}=\frac{2}{3}$$

$\Rightarrow 12x-24=2x+16$

$\Rightarrow 10x=40 \Rightarrow x=4$

$\therefore$ Initial quantity of liquid A = 16 litre

28. (c) A's profit : B's profit

$$= \frac{1}{3} : \frac{2}{3} = 1 : 2$$

$$\therefore \frac{\text{A's equivalent capital}}{\text{B's equivalent capital}} = \frac{1}{2}$$

$$\Rightarrow \frac{\frac{x}{4} \times 15}{\frac{3x}{4} \times n} = \frac{1}{2} \Rightarrow \frac{15}{3n} = \frac{1}{2}$$

$\Rightarrow n = 10$ months

29. (b) Required ratio $= 8 \times 7 : 5 \times 9 = 56 : 45$

30. (d) $A = B + 4000$

$B = C + 5000$

$A + B + C = 50000$

$\therefore A + A - 4000 + A - 9000 = 50000$

So, $A = 21000$

$B = 17000$

$C = 12000$

$\therefore A : B : C = 21000 : 17000 : 12000 = 21 : 17 : 12$

$$\text{A's Profit} = \frac{21}{50} \times 35000 = ` 14700$$

31. (a) The ratio of number of coins $= 5 : 6 : 4$

$\therefore$ The number of one rupee coins

$$= \frac{465}{5+6+4} \times 5 = 155$$

$$\text{The number of 50 paise coins} = \frac{465}{5+6+4} \times 6 = 186$$

$$\text{The number of 25 paise coins} = \frac{465}{5+6+4} \times 4 = 124$$

32. (d) According to question

$$\frac{36+n}{50+n} = \frac{3}{4}$$

$\Rightarrow 36 \times 4 + 4n = 50 \times 3 + 3n$

$\Rightarrow 4n - 3n = 150 - 144$

$\Rightarrow n = 6$

33. (b) Number of brown socks $= x$

Price of brown socks = Rs. y per pair

Price of black socks = Rs. $2y$ per pair

$$\therefore 4y + x \times 2y = \frac{150}{100}(4 \times 2y + xy)$$

$$\Rightarrow 4 + 2x = \frac{3}{2}(8 + x)$$

$\Rightarrow 8 + 4x = 24 + 3x$

$\Rightarrow x = 24 - 8 = 16$

$\therefore$ Requried ratio $= 4 : 16 = 1 : 4$

34. (b) $$\text{Required ratio} = \left(\frac{2}{3} + \frac{3}{5} + \frac{5}{8}\right) : \left(\frac{1}{3} + \frac{2}{5} + \frac{3}{8}\right)$$

$$= \left(\frac{80+72+75}{120}\right) : \left(\frac{40+48+45}{120}\right) = 227 : 133$$

35. (d) $$\frac{A}{B} = \frac{5}{6} \Rightarrow B = \frac{6}{5}A \quad \ldots(1)$$

$$\frac{A+2}{B+2} = \frac{7}{8} \Rightarrow 8A + 16 = 7B + 14 \Rightarrow 7B - 8A = 2 \quad \ldots(2)$$

From (1) and (2), $A = 5, B = 6$

$$\therefore \frac{5+12}{6+12} = \frac{17}{18}$$

36. (c) Suppose, B Joined after x month

Then B's money was invested for $(12 - x)$ months

$\therefore$ According to question,

$$\frac{64000 \times 12}{48000 \times (12 - x)} = \frac{2}{1}$$

$$\frac{16}{12 - x} = \frac{2}{1} \Rightarrow 16 = 24 - 2x$$

$\Rightarrow 2x = 24 - 16 \Rightarrow x = 4$

Hence, B joined after 4 months

37. (a) Numbers $= x$, $2x$ and $3x$

$$\therefore \frac{x+5}{2x+5} = \frac{2}{3}$$

$\Rightarrow 4x + 10 = 3x + 15$

$\Rightarrow x = 5$

$\Rightarrow$ Number $= 5$, 10 and 15

38. (b) $A : B = 2 : 3 = 8 : 12$

$B : C = 4 : 5 = 12 : 15$

$\therefore A : B : C = 8 : 12 : 15$

Sum of ratio $= 35$

$$\therefore \text{A's share} = \frac{8}{35} \times 700$$

$= ` 160$

$$\text{B's share} = \frac{12}{35} \times 700 = ` 240$$

$$\text{C's share} = \frac{15}{35} \times 700 = ` 300$$

39. (c) Incomes of A and B

$= ` 6x$ and $` 5x$

Expenses of A and B

$= ` 4y$ and $` 3y$

$\therefore 6x - 4y = 400 \quad \ldots(i)$

$5x - 3y = 400 \quad \ldots(ii)$

By equation (i) $\times 3$ – (ii) $\times 4$

$\Rightarrow 18x - 12y - 20x + 12y$

$= 1200 - 1600$

$\Rightarrow 2x = 400 \Rightarrow x = 200$

$\therefore$ Total income

$= 6x + 5x = 11x = ` 2200$

40. (b) $A + B = 3(B + C)$

$A + B + C = A + 30$

$B = 5C$

$\therefore A + B = 3(B + C)$

$\Rightarrow A + 5C = 18C \Rightarrow A = 13C$

$\therefore A+B+C=A+30$

$\Rightarrow A+5C+C=A+30$

$\Rightarrow A+\frac{6A}{13}=A+30$

$\Rightarrow 6A=30\times 13$

$\Rightarrow A=$ ` 65

Alternate Method:

Let $C=C$ $\quad B=5C$

$A+B=3(B+C)$

$A+5C=3\times 6C \quad \therefore A=13C$

$A+B+C=A+30$

$SC+C=30 \quad \therefore C=15$

$A=13\times 5=65$

41. (b) Alcohol = 3 litres

Water = 12 litres

$\therefore$ Required percentage

$=\frac{3}{15+3}\times 100$

$=\frac{50}{3}=16\frac{2}{3}$

42. (a) $7x-5x=200$

$\Rightarrow 2x=200\Rightarrow x=100$

$\therefore$ Price of a pair of shoes $=5x=$ ` 500

43. (d) $Q=P+30\Rightarrow Q-P=30$ and

$R-Q=60=2\times 30$

$\therefore$ Required ratio $=2:3:5$

Look : $3-2=1, 5-3=2$

44. (b) $4A=6B\Rightarrow 2A=3B\Rightarrow A:B=3:2$

$6B=3C\Rightarrow 2B=C\Rightarrow B:C=1:2$

A	:	B	:	C
3	:	2		
		1	:	2
3	:	2	:	4

A's share

$=\frac{3}{(3+2+4)}\times 1800=\frac{3}{9}\times 1800=$ ` 600

Shortcut Method:

$4A=6B=3C$

$A:B:C=18:12:24=3:2:4$

Share of A $=1800\times\frac{3}{9}=$ ` 600

45. (c) Let lst, 2nd and 3rd part represented by x, y, z

Let $\frac{1}{2}x=\frac{1}{3}y=\frac{1}{4}z=k$

$\therefore \quad x=2k, y=3k, z=4k$

According to question

$x+y+z=81$

$\Rightarrow \quad 2k+3k+4k=81\Rightarrow 9k=81\Rightarrow k=9$

Hence, parts are 18, 27, 36.

46. (d) $(5^2)^{2.5}=5^5:5^3=5^2:1=25:1$

47. (b) $2x=3y=4z$

$x=2z, y=\frac{4}{3}z$

$x:y:z=2z:\frac{4}{3}z:z=6:4:3$

48. (d) Let ages of A, B and C are 5x, 8x and 9x respectively.

$\therefore 5x+9x=56\Rightarrow x=4$

$\therefore$ Age of B $=8\times 4=32$ years

49. (d) Ratio of number of coins

$=8:4\times 2:3\times 4=8:8:12=2:2:3$

Number of one rupee coin $=\frac{2}{2+2+3}\times 240=80$

50. (a) $\frac{x}{y}=\frac{2}{3};\ \frac{2}{x}=\frac{4}{8}\Rightarrow x=4\Rightarrow y=\frac{3}{2}x=\frac{3}{2}\times 4=6$

51. (b) $\frac{A}{B}=\frac{3}{4};\ \frac{B}{C}=\frac{3.5}{3}=\frac{7}{6}$ and $A+B+C=730$

$\therefore \frac{3}{4}B+B+\frac{6}{7}B=730$

$\Rightarrow B\left(\frac{3}{4}+1+\frac{6}{7}\right)=730\Rightarrow B=\frac{730\times 28}{73}=280$

$\therefore C=\frac{6}{7}\times B=\frac{6}{7}\times 280=240$

B exceeds that of C by $(280-240)=$ ` 40

52. (c) $\frac{4}{7}+\frac{\frac{2y}{y}-\frac{x}{y}}{\frac{2y}{y}+\frac{x}{y}}=\frac{4}{7}+\frac{2-\frac{4}{5}}{2+\frac{4}{5}}=\frac{4}{7}+\frac{6}{14}=1$

53. (b) Let two numbers be 3x and 5x

$\frac{3x-9}{5x-9}=\frac{12}{23}$

$\Rightarrow 23(3x-9)=12(5x-9)\Rightarrow 69x-207=60x-108$

$\Rightarrow 9x=99\Rightarrow x=11$

Hence, the small number will be $3\times 11=33$

54. (c) $\frac{x}{y}=\frac{5}{2}$

$\frac{8x+9y}{8x+2y}=\frac{8\frac{x}{y}+\frac{9y}{y}}{8\frac{x}{y}+\frac{2y}{y}}=\frac{8\times\frac{5}{2}+9}{8\times\frac{5}{2}+2}=\frac{29}{22}$

55. (d) By rule of alligation, we have

Gold 19 times $\quad$ Copper 9 times

15 times

$15-9=6 \quad 19-15=4$

$\therefore$ Required ratio $=\frac{6}{4}=3:2$

56. (b) Ratio of income of x and y = 4 : 3
Ratio of expenditure of x and y = 12 : 7
Saving of x = 4a – 12b = 3200 ...(i)
Saving of y = 3a – 7b = 3200 ..(ii)
Solving (i) and (ii)

$$\begin{array}{rcl} 12a-36b & = & 9600 \\ \underline{-12a+28b} & = & \underline{-12800} \\ -8b & = & 3200 \end{array} \quad \text{i.e. } b = 400$$

Now 3a = 3200 + 7b = 3200 + 7 (400) = 6000
a = ` 2000
So income of x = ` 2000 × 4 = 8000

57. (a) Ratio of present ages of Sonali and Monali = 5 : 3
After 5 years, ratio of ages of both girls = 10:7
Let actual present ages are 5x and 3x years.

$$\frac{5x+5}{3x+5} = \frac{10}{7}$$

$$\Rightarrow 35x + 35 = 30x + 50$$

$$\Rightarrow 5x = 15$$

$$\Rightarrow x = 3$$

So, Monali age = 3 × 3 = 9 years

58. (d) 12ℓ of milk taken out of 60ℓ milk. So, 20% water is added to milk
Milk = 48ℓ ; Water = 12ℓ
Now, again 20% water is added to this mixture

$$\underset{(\text{milk})}{48} \xrightarrow[-9.6]{20\%} \underset{(\text{milk})}{38.4} \text{ and } \underset{(\text{water})}{21.6}$$

So, ratio of milk and water = 38.4 : 21.6 = 16 : 9

Alternate Method:
Final Volume of milk = Initial volume

$$\times \frac{\text{Total Volume} - \text{Eliminated Volume}}{100} \text{x...}$$

$$= 60 \times \frac{48}{60} \times \frac{48}{60} = \frac{192}{5}$$

$$\text{Water} = 60 - \frac{192}{5} = \frac{108}{5}$$

$$\text{Required ratio} = \frac{192}{5} : \frac{108}{5} = 16 : 9$$

59. (b) Let the A's age and B's age was 8x and 13x
According to question

$$\frac{8x+18}{13x+18} = \frac{5}{7}$$

$$\Rightarrow 56x + 18 \times 7 = 65x + 18 \times 5$$

$$\Rightarrow 65x - 56x = 18 \times 7 - 18 \times 5$$

$$\Rightarrow 9x = 18 \times 2$$

$$\Rightarrow x = 4$$

Hence, the present age of A
= 8 × 4 + 18 = 50 yrs.

60. (d) $\text{Quantity of milk} = \frac{7}{9} \times 729 = 567 \text{ ml}$

$\text{Quantity of water} = \frac{2}{9} \times 729 = 162 \text{ ml}$

Let 'x' be the quantity that should be added to make the ratio 7 : 3
According the question

$$\frac{567}{162+x} = \frac{7}{3}$$

$$\Rightarrow 1701 = 1134 + 7x$$

$$\Rightarrow 7x = 1701 - 1134$$

$$\Rightarrow x = 81 \text{ ml}$$

61. (d) According to question

$$\frac{2+x}{5+x} = \frac{5}{6}$$

$$\Rightarrow 12 + 6x = 25 + 5x$$

$$\Rightarrow x = 25 - 12 = 13.$$

62. (d) $B^2 - A^2 = 81$

$$\frac{A}{B} = \frac{4}{5} \Rightarrow \frac{B}{A} = \frac{5}{4}$$

Squaring both sides, we get

$$\Rightarrow \frac{B^2}{A^2} = \frac{25}{16}$$

both sides substract 1

$$\Rightarrow \frac{B^2 - A^2}{A^2} = \frac{25-16}{16} = \frac{9}{16} \Rightarrow \frac{81}{A^2} = \frac{9}{16}$$

$$\Rightarrow A^2 = 16 \times 9$$

$$\boxed{\therefore A = 12}$$

Shortcut Method:
Let A be 4x and B be 5x
$(5x)^2 - (4x)^2 = 81$ (given)
$9x^2 = 81 \quad \therefore x = 3$
$A = 3 \times 4 = 12$

63. (b) Ratio of boy and girl = 7 : 5
Number of student = 720

$$\text{Number of Girl} = \frac{5}{120} \times 720 = 300$$

Number of Boy = 720 – 300 = 420
Number of girl needed = 420 – 300 = 120

64. (b) A invested = ` 3000
B invested = ` 2400

$$\frac{\text{A invested}}{\text{B invested}} = \frac{\text{A's loss}}{\text{B's loss}}$$

According to Question, (A + B) = ` 720

$$\Rightarrow A = 720 - B$$

$$\therefore \frac{3000}{2400} = \frac{720-B}{B}$$

$$\Rightarrow \frac{720-B}{B} = \frac{5}{4} \Rightarrow 9B = 2880 \Rightarrow B = 320$$

65. (c) Let x, y and z be 2m, 3m and 5m.
According to Question,
$2m+3m+5m=80$
$\Rightarrow 10m=80 \Rightarrow m=8$
$z=a, x-8$
$\therefore 5(8)=a(2)(8)-8$
$\Rightarrow 40+8=16a \Rightarrow 48=16a \Rightarrow a=3$

66. (b) Let the number be 3x and 4x
$(3x)^3+(4x)^3=5824$
$\Rightarrow 27x^3+64x^3=5824 \Rightarrow 91x^3=5824$
$\Rightarrow x^3=64 \Rightarrow x=4$
$\therefore$ Sum of numbers are $= x(4+3)=4\times 7=28$

67. (b) Suppose, the can initially contains 7x and 5x of volume of a mixtures of A and B of volume respectively.
ATQ

$$\frac{7x-\frac{21}{4}}{\left(5x-\frac{15}{4}\right)+9}=\frac{7}{9}$$

$$\Rightarrow \frac{28x-21}{20x+21}=\frac{7}{9}$$

$\Rightarrow 252x-189=140x+147$
$\Rightarrow 112x=336 \Rightarrow x=3$
So, the can contained 21 litres of A initially.

68. (d) Ratio of volumes

$$\frac{V_1}{V_2}=\frac{\pi(2)^2\times 3}{\pi(1)^2\times 2}$$

$$\frac{V_1}{V_2}=\frac{4\times 3}{2} \qquad \frac{V_1}{V_2}=\frac{6}{1} \text{ or } 6:1$$

69. (c) According to question,

$$\frac{3}{7}P=\frac{4}{11}Q$$

$$\therefore \quad \frac{P}{Q}=\frac{4}{11}\times\frac{7}{3}=\frac{28}{33}$$

70. (b) Share of A $=\frac{3200}{16}\times 3=$ ` 600

Share of B $=\frac{3200}{16}\times 5=$ ` 1000

Share of C $=\frac{3200}{16}\times 8=$ ` 1600

$\therefore$ Difference between B and C $=(1600-1000)=$ ` 600.

71. (c) Let A, B, and C invested amounts in the ratio 300 : 400 : 500 respectively.
then,
$\therefore$ Required ratio

$$=\frac{300\times 120}{100}:\frac{400\times 115}{100}:\frac{500\times 110}{100}=36:46:55.$$

72. (d) $A:B=2:5$

$$B:C=4:3=\left(4\times\frac{5}{4}:3\times\frac{5}{4}\right)=5:\frac{15}{4}$$

$$C:D=2:1=\left(2\times\frac{15}{8}:1\times\frac{15}{8}\right)=\frac{15}{4}:\frac{15}{8}$$

$$\therefore \quad A:B:C:D=2:5:\frac{15}{4}:\frac{15}{8}=16:40:30:15$$

$\therefore$ Value of $A:C:D=16:30:15$

73. (d) Here, $a=9$, $b=24$ and $c=?$

$$\text{So, } \frac{9}{24}=\frac{24}{c}$$

$$\therefore \quad c=\frac{24\times 24}{9}=64$$

74. (d) Let present age of father = x
present age of son = y
According to question,
$x+y=90$ ...(i)

$$\text{Now, } \frac{x-10}{y-10}=\frac{5}{2} \Rightarrow 2x-20=5y-50$$

$\Rightarrow 2x-5y=-30$ ...(ii)
from eq. (i) and (ii); $x=60$; $y=30$
$\therefore$ The present age of father = 60 years.

75. (c) According to question,

$$A=2k=4k\,;\ B=\frac{5}{2}k=5k\,;\ C=3k=6k$$

$$\therefore \quad A:B:C=4:5:6$$

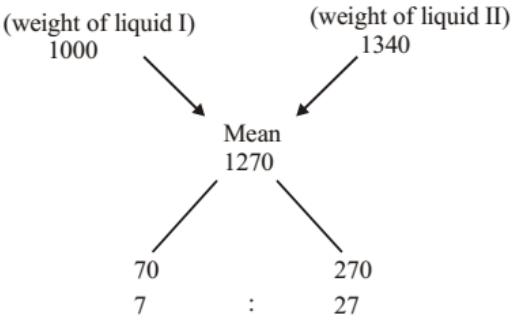
76. (c) Let third number = x
then,
second number = 2x
first number = 4 x
According to question,

$$\frac{\left(\frac{1}{x}+\frac{1}{2x}+\frac{1}{4x}\right)}{3}=\frac{7}{12}$$

$$\therefore \quad x=9$$

$\therefore$ first number $=4x=4\times 9=36$
second number $=2x=2\times 9=18$
third number $=x=9$

77. (b) According to question,



$\therefore$ The ratio of their volumes = 7 : 27.

78. (a) Here,

$2A = 3B$ and $3B = 2C$

$\therefore \quad \frac{A}{B} = \frac{3}{2}$ and $\therefore \quad \frac{B}{C} = \frac{2}{3}$

$\therefore \quad \frac{A}{C} = \frac{A}{B} \times \frac{B}{C} = \frac{3}{2} \times \frac{2}{3} = 1:1$

Let $\frac{A}{3} = \frac{B}{2} = \frac{C}{3} = k$

Then $A = 3k,\ B = 2k,\ C = 3k,$

$\therefore \quad A : B : C = 3 : 2 : 3$

79. (a) Let total investment = x

Investment by Raman $= \frac{2x}{5}$

Investment by Manan $= \frac{3x}{8}$

Investment by Kamal $= x - \left(\frac{2x}{5} + \frac{3x}{8}\right) = \frac{9x}{40}$

Ratio of invest of Raman, Manan and Kamal

$= \frac{2x}{5} : \frac{3x}{8} : \frac{9x}{40} = 16 : 15 : 9$

$\therefore$ Ratio of profit of Raman, Manan and Kamal $= 16 : 15 : 9$

80. (c) Mean proportion of 8.1 and 3.6 $= \frac{11.7}{2} = 5.8$

and third proportion of 2 and 3 is $\frac{3}{0.66} = 4.5$

Ratio $= \frac{5.85}{4.5} \approx \frac{6}{5}$

81. (d) Quantity in container of capacity

$40\,L = 40 \times \frac{87.5}{100} = 35\,L.$

Quantity in container of capacity

$30\,L = 30 \times \frac{80}{100} = 24\,L.$

Quantity in container of capacity

$20\,L = 20 \times \frac{90}{100} = 18\,L.$

Milk in three Containers

$= 35 \times \frac{\hat{3}}{5} + 24 \times \frac{\tilde{5}}{6} + 18 \times \frac{\tilde{7}}{9} = 21 + 20 + 14 = 55$

Water in three Containers

$= 35 \times \frac{2}{5} \times 24 \times \frac{1}{6} \times 18 \times \frac{2}{9} = 14 + 4 + 4 = 22.$

Ratio of milk to water $= \frac{55}{22} = \frac{5}{2} = 5 : 2.$

82. (c) Total number of students = 640

Ratio of the number of boys to the number of girls = 5 : 3

$\therefore \quad$ Number of girls $= \frac{640}{8} \times 3 = 240$

Number of boys $= \frac{640}{8} \times 5 = 400$

Now, $\frac{240 + 30}{400 + x} = \frac{9}{14}$

$\frac{270}{400 + x} = \frac{9}{14} \Rightarrow 3600 + 9x = 3780$

$\therefore \quad 9x = 3780 - 3600 = 180$

$\therefore \quad x = \frac{180}{9} = 20$

83. (b) Income = 4 : 3

expenditure = 3 : 2

savings = 1 : 1

ATQ, $\frac{4x - 4000}{3x - 6000} = \frac{3}{2}$

$8x - 8000 = 9x - 18000$

$x = 10{,}000$

$\therefore \quad$ Income of Pawan $= 4 \times 10{,}000 = 40{,}000$

$\therefore \quad$ Income of Sunil $= 3 - 10{,}000 = 30{,}000$

Total monthly income $= 40{,}000 + 30{,}000 = 70{,}000$

84. (d) Ratio of shares of Seema : Komal = 1.5 : 2

and Komal : Rita = 2 : 2.5

$\therefore$ Seema : Komal : Rita = 1.5 : 2 : 2.5 = 3 : 4 : 5.

Hence, Rita's share $= \frac{5}{(3+4+5)} \times 3600 =$ ` 1500.

85. (b) Average of the amount = ` 4520

Total amount $= 4520 \times 3 =$ ` 13560

A : B : C

$83 \times 2 \quad 75 \times 2$

$2 \times 83 \quad 3 \times 83$

A : B : C

166 150 249

$(166 + 150 + 249) \rightarrow 13560$

$565 \rightarrow 13560$

$1 \rightarrow \frac{13560}{565}$

$150 \rightarrow \frac{13560}{565} \times 150 = 3600$

$\therefore \quad$ Share of B = 3600

86. (d) Balance money = 100 – 20 = ` 80

Ratio of ` 2, ` 5 and ` 10 coins = 5 : 4 : 1

$\therefore \quad$ Total amount $= 5 \times 2 + 4 \times 5 + 10 \times 1$

$= 10 + 20 + 10 = 40$

According to the question,

$40 \rightarrow 80$

$1 \rightarrow 2$

$\therefore \quad$ Number of ` 5 coins $= 2 \times 4 = 8$

87. (a) According to question,

$$\frac{13+\frac{13\times15}{100}}{17+\frac{17\times30}{100}}=\frac{\frac{1300+195}{100}}{\frac{1700+510}{100}}=\frac{1495}{2210}=\frac{23}{34}$$

Hence, new ratio is = 23 : 34

88. (c) Let passed candidates = $5x$

And, failed candidates = $2x$

According to question,

$$\Rightarrow\frac{5x-14}{2x+14}=\frac{4}{3}$$

$$\Rightarrow 15x-42=8x+56$$

$$\Rightarrow 7x=98$$

Number of candidates appeared = $7x=98$

89. (b) let, income of A = x

let income of B = $2x$

let, expenditure of A = $2y$

expenditure of B = $3y$

$$\Rightarrow\frac{80}{100}\times3y=x\Rightarrow\frac{12y}{5}=x\Rightarrow\frac{y}{x}=\frac{5}{12}$$

$\Rightarrow$ Income of A = 12

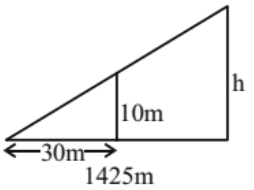
Income of B = $2\times12=24$

Expenditure of A = $2\times5=10$

Expenditure of B = $3\times5=15$

Savings ratio = 12 – 10 : 24 – 15 = 2 : 9

90. (a)



$$\Rightarrow\frac{10}{30}=\frac{h}{1425}$$

$$\Rightarrow h=475\text{ m}$$

91. (c) $\frac{x-7}{y-7}=\frac{4}{5}$

$5x-35=4y-28$

$5x-4y=7$ …(1)

$\frac{x+8}{y+8}=\frac{9}{10}$

$10x+80=9y+72$

$10x-9y=-8$ …(2)

Equ. (1) & (2),

$y=22$ & $x=19$

$x+y=41$

92. (c) A : B : C

13750 : 16250 : 18750

11 : 13 : 15

$$\text{Total profit}=\frac{5200}{13}\times39$$

$=15600$

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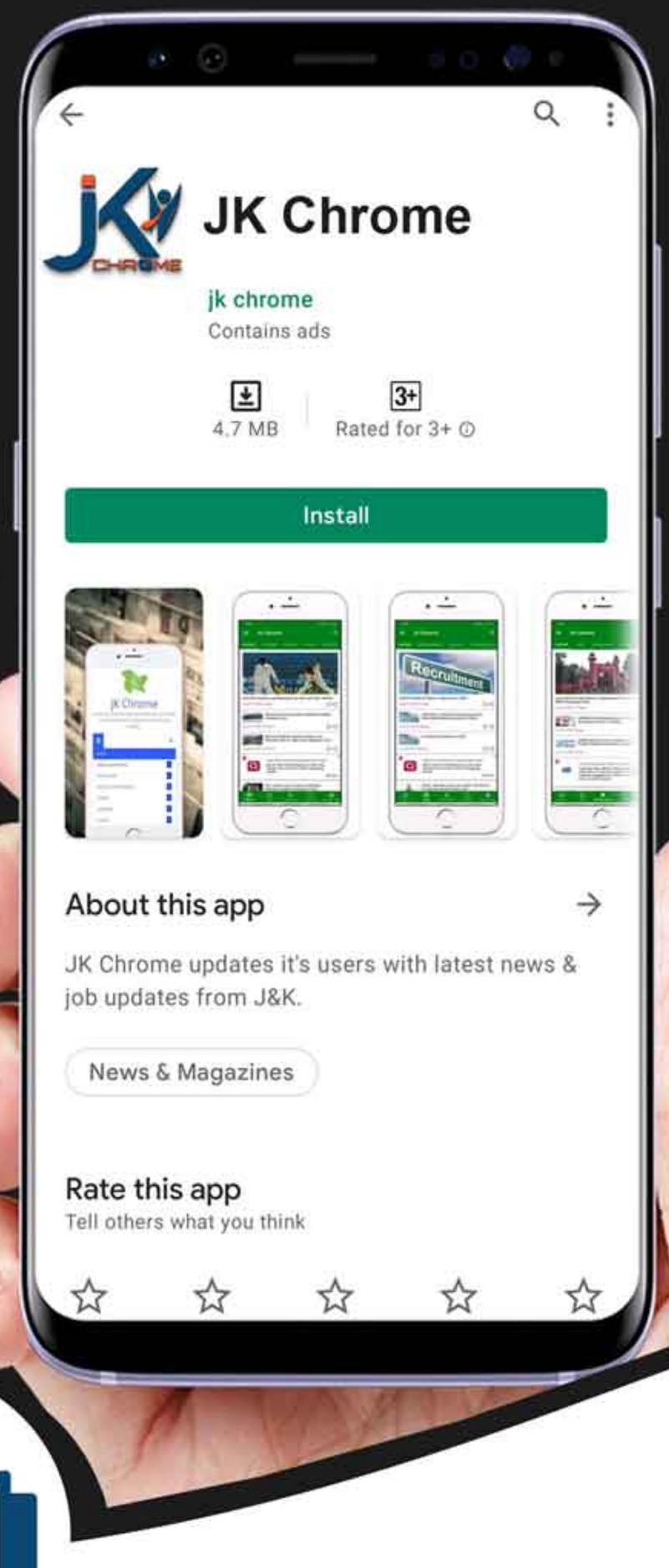

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