

RATIO AND PROPORTION

18. In 28 litres mixture of milk and water the ratio of milk and water is 5 : 2. How much water should be added in the mixture so that the ratio of milk to water becomes 2 : 5?
 (1) 42 litres (2) 32 litres (3) 24 litres (4) 39 litres (5) None of these
19. In a mixture of 60 litres, the ratio of milk and water is 2 : 1. If the ratio of milk and water is to be 1 : 2, then the amount of water to be further added is:
 (1) 42 litres (2) 56 litres (3) 60 litres (4) 77 litres (5) None of these
20. A mixture contains milk and water in the ratio of 9 : 4. On adding 4 litres of water, the ratio of milk to water becomes 3 : 2. Find the total quantity of the original mixture.
 (1) 26 litres (2) 18 litres (3) 10 litres (4) 30 litres (5) None of these
21. A mixture contains milk and water in the ratio of 4 : 3. On adding 2 litres of water, the ratio of milk to water becomes 8 : 7. Find the total quantity of the final mixture.
 (1) 16 litres (2) 12 litres (3) 28 litres (4) 30 litres (5) None of these
22. The ratio between two numbers is 15 : 7. If each number be decreased by 2, the ratio becomes 7 : 3. Find the numbers.
 (1) 15, 7 (2) 30, 14 (3) 45, 21 (4) 60, 28 (5) None of these
23. The incomes of A and B are in the ratio 9 : 4 and their expenditures are in the ratio 7 : 3. If each saves ₹ 2000, what are their incomes?
 (1) ₹ 90000, ₹ 4000 (2) ₹ 27000, ₹ 12000 (3) ₹ 72000, ₹ 16000
 (4) ₹ 72000, ₹ 32000 (5) None of these
24. A mixture contains milk and water in the ratio of 9 : 4. On adding 8 litres of water, the ratio of milk to water becomes 3 : 2. Find the total quantity of the original mixture.
 (1) 52 litres (2) 26 litres (3) 104 litres (4) 30 litres (5) None of these
25. A mixture contains milk and water in the ratio of 4 : 3. On adding 6 litres of water, the ratio of milk to water becomes 8 : 7. Find the total quantity of the final mixture.
 (1) 168 litres (2) 12 litres (3) 42 litres (4) 84 litres (5) None of these
26. Find the number which, when added to the terms of the ratio 13 : 28 makes it equal to the ratio 1 : 2.
 (1) 4 (2) 3 (3) 2 (4) 1 (5) None of these
27. Find the number which, when added to the terms of the ratio 9 : 17 makes it equal to the ratio 3 : 5.
 (1) 4 (2) 3 (3) 2 (4) 1 (5) None of these
28. Find the number which, when subtracted from the terms of the ratio 15 : 17 makes it equal to the ratio 6 : 7.
 (1) 4 (2) 3 (3) 2 (4) 1 (5) None of these
29. Find the number which, when subtracted from the terms of the ratio 11 : 25 makes it equal to the ratio 4 : 11.
 (1) 4 (2) 3 (3) 2 (4) 1 (5) None of these
30. A bucket contains a mixture of two liquids A and B in the proportion 5 : 3. If 16 litres of the mixture is replaced by 16 litres of liquid B, then the ratio of the two liquids becomes 3 : 5. How much of the liquid B was there in the bucket?
 (1) 25 litres (2) 15 litres (3) 18 litres (4) 24 litres (5) None of these
31. A bucket contains a mixture of two liquids A and B in the proportion 6 : 5. If 33 litres of the mixture is replaced by 33 litres of liquid B, then the ratio of the two liquids becomes 3 : 4. How much of the liquid A was there in the bucket?
 (1) 84 litres (2) 48 litres (3) 70 litres (4) 64 litres (5) None of these
32. A vessel contains liquids A and B in ratio 3 : 1. If 8 litres of the mixture are removed and the same quantity of liquid B is added, the ratio becomes 1 : 3. What quantity does the vessel hold?
 (1) 12 litres (2) 14 litres (3) 16 litres (4) 10 litres (5) None of these
33. A vessel contains liquids A and B in ratio 7 : 6. If 26 litres of the mixture are removed and the same quantity of liquid B is added, the ratio becomes 6 : 7. What quantity does the vessel hold?
 (1) 142 litres (2) 172 litres (3) 156 litres (4) 182 litres (5) None of these
34. An employer reduces the number of his employees in the ratio 9 : 4 and increases their wages in the ratio 2 : 5. State whether his bill of total wages increases or decreases, and in what ratio?
 (1) Decrease, 10 : 9 (2) Increase, 10 : 9 (3) Decrease 9 : 11 (4) Increase, 9 : 10 (5) None of these
35. Two candles of the same height are lighted at the same time. The first is consumed in 8 hours and the second in 6 hours. Assuming that each candle burns at a constant rate, in how many hours after being lighted, the ratio between the first and second candles becomes 2 : 1.
 (1) 2 hours 24 minutes (2) 4 hours (3) 1 hour 12 minutes
 (4) 4 hours 48 minutes (5) None of these

36. Two candles of the same height are lighted at the same time. The first is consumed in 7 hours and the second in 6 hours. Assuming that each candle burns at a constant rate, in how many hours after being lighted, the ratio between the first and second candles becomes 3 : 1.
- (1) 5 hours 36 minutes (2) 5 hours (3) 5 hours 60 minutes
 (4) 6 hours (5) None of these
37. Two candles of the same height are lighted at the same time. The first is consumed in 3 hours and the second in 1 hour. Assuming that each candle burns at a constant rate, in how many hours after being lighted, the ratio between the first and second candles become 2 : 1.
- (1) 48 minutes (2) 1 hour 36 min (3) 36 minutes (4) 60 minutes (5) None of these
38. Divide 1162 into three parts such that 4 times the first is equal to 5 times the second and 7 times the third. Find the value of smallest part.
- (1) 490 (2) 492 (3) 390 (4) 280 (5) None of these
39. Divide ₹. 680 among A, B and C such that A gets $\frac{2}{3}$ of what B gets and B gets $\frac{1}{4}$ th of what C gets. What is C's share?
- (1) ₹ 280 (2) ₹ 380 (3) ₹ 480 (4) ₹ 120 (5) None of these
40. When 50% of one number is added to a second number, the second number increases to its four-thirds. What is the ratio between the first number and the second number?
- (1) 3 : 2 (2) 3 : 4 (3) 2 : 3 (4) Data inadequate (5) None of these
41. ₹ 600 has been divided among A, B and C in such a way that ₹. 10 more than $(2/5)$ of A's share, ₹. 20 more than $(2/7)$ of B's share, ₹. 10 more than $(9/17)$ of C's share, are all equal. A's share is:
- (1) ₹ 280 (2) ₹ 170 (3) ₹ 150 (4) ₹ 200 (5) None of these
42. Gold is 19 times as heavy as water and copper 9 times as heavy as water. The ratio in which these two metals be mixed so that the mixture is 15 times as heavy as water, is:
- (1) 1 : 2 (2) 2 : 3 (3) 3 : 2 (4) 19 : 135 (5) None of these
43. One year ago the ratio between Laxman's and Gopal's salary was 3 : 4. The individual ratios between their last year's and this year's salaries are 4 : 5 and 2 : 3 respectively. At present the total of their salary is ₹ 4160. The salary of Laxman now, is
- (1) ₹ 1600 (2) ₹ 2560 (3) ₹ 1040 (4) ₹ 3120 (5) None of these

ANSWER

RATIO AND PROPORTION

1.1	2.4	3.1	4.1	5.1	6.3	7.4	8.1	9.2	10.3	11.4	12.3	13.3	14.3
15.2	16.1	17.1	18.1	19.3	20.1	21.4	22.2	23.4	24.1	25.5	26.3	27.2	28.2
29.2	30.2	31.1	32.1	33.4	34.4	35.4	36.1	37.3	38.4	39.3	40.3	41.3	42.3
43.1													

ALLIGATION (MIXTURE)

1. In what proportion must wheat at ₹ 3.20 per kg be mixed with wheat at ₹ 3.70 per kg, so that the mixture be worth ₹ 3.35 a kg?
 (1) 9:5 (2) 7:5 (3) 7:3 (4) 3:1 (5) None of these
2. Prabhu purchased 30 kg of rice at the rate of ₹ 17.50 per kg and another 30 kg rice at a certain rate. He mixed the two and sold the entire quantity at the rate of ₹ 18.60 per kg and made 20 per cent overall profit. At what price per kg did he purchase the lot of another 30 kg rice?
 (1) ₹ 14.50 (2) ₹ 12.50 (3) ₹ 15.50 (4) ₹ 13.50 (5) None of these
3. A mixture of a certain quantity of milk with 25 litres of water is worth ₹ 2 per litre. If pure milk is worth ₹ 12 per litre how much milk is there in the mixture?
 (1) 5 litres (2) 7 litres (3) 6 litres (4) 4 litres (5) None of these
4. In what proportion must water be mixed with spirit to gain 16% by selling it at cost price?
 (1) 4:25 (2) 2:9 (3) 1:6 (4) 25:4 (5) None of these
5. In what proportion must water be mixed with spirit to gain 25% by selling it at cost price?
 (1) 4:1 (2) 3:4 (3) 4:3 (4) 1:4 (5) None of these
6. A petrol pump owner mixed leaded and unleaded petrol in such a way that the mixture contains 10% unleaded petrol. What quantity of leaded petrol should be added to 1 litre mixture so that the percentage of unleaded petrol becomes 5%.
 (1) 1000 ml (2) 900 ml (3) 1900 ml (4) 1800 ml (5) None of these
7. 150 gm of sugar solution has 20% sugar in it. How much sugar should be added to make it 25% in the solution?
 (1) 10 gm (2) 45 gm (3) 35 gm (4) 40 gm (5) None of these
8. There are 75 students in a class, 48 rupees are distributed among them so that each boy gets Re 1 and each girl gets 40 P. Find the number of boys and girls in that class.
 (1) 30, 45 (2) 40, 35 (3) 25, 50 (4) 35, 40 (5) None of these
9. There are 50 students in a class, 32 rupees are distributed among them so that each boy gets Re 1 and each girl gets 50 P. Find the number of girls and boys in that class.
 (1) 14 girls, 36 boys (2) 36 girls, 14 boys (3) 20 girls, 30 boys (4) 30 girls, 20 boys (5) None of these
10. A milk seller pays ₹ 500 per kilolitre for his milk. He adds water to it and sells the mixture at 56 P a litre, thereby making altogether 40% profit. Find the proportion of water to milk which his customers receive.
 (1) 1:4 (2) 2:3 (3) 1:8 (4) 4:1 (5) None of these
11. A person has a chemical of ₹ 50 per litre. In what ratio should water be mixed in that chemical so that after selling the mixture at ₹ 40 per litre he may get a profit of 50%.
 (1) 7:8 (2) 9:8 (3) 10:7 (4) 4:3 (5) None of these
12. A person travels 245 km in 6 hours in two stages. In the first part of the journey, he travels by bus at the speed of 30 km per hr. In the second part of the journey, he travels by train at the speed of 50 km per hr. How much distance did he travel by train?
 (1) 162.5 km (2) 82.5 km (3) 164 km (4) 83 km (5) None of these
13. A trader has 25 kg of rice, part of which he sells at 4% profit and the rest at 9% profit. He gains 7% on the whole. What is the quantity sold at 9% profit?
 (1) 15 kg (2) 10 kg (3) 18 kg (4) 12 kg (5) None of these
14. Ritu's expenditure and saving are in the ratio 5 : 2. Her income increases by 12%. Her expenditure also increases by 14%. By how many % does her saving increase?
 (1) 14% (2) 7% (3) 8% (4) 9% (5) None of these
15. Sita's expenditure and saving are in the ratio 5 : 3. Her income increases by 15%. Her expenditure also increases by 9%. By how many % does her saving increase?
 (1) 20% (2) 30% (3) 25% (4) 24% (5) None of these
16. A vessel of 120 litres is filled with milk and water. 80% of milk and 40% of water is taken out of the vessel. It is found that the vessel is vacated by 65%. What was the ratio of milk to water in the original mixture?
 (1) 5:3 (2) 6:5 (3) 3:5 (4) 4:3 (5) None of these
17. In a zoo, there are rabbits and pigeons. If heads are counted, there are 100 and if legs are counted, there are 290. How many rabbits are there?
 (1) 55 (2) 45 (3) 40 (4) 50 (5) None of these
18. In a zoo, there are rabbits and pigeons. If heads are counted, there are 50 and if legs are counted, there are 140. How many pigeons are there?
 (1) 20 (2) 25 (3) 30 (4) 35 (5) None of these

19. A jar contains a mixture of two liquids A and B in the ratio 3 : 1. When 15 litres of the mixture is taken out and 9 litres of liquid B is poured into the jar, the ratio becomes 3 : 4. How many litres of liquid was contained in the jar?
 (1) 27 litres (2) 24 litres (3) 30 litres (4) 21 litres (5) None of these
20. A vessel contains mixture of liquids A and B in the ratio 3 : 2. When 20 litres of the mixture is taken out and replaced by 20 litres of liquid B, the ratio changes to 1 : 4. How many litres of liquid A was there initially?
 (1) 14 litres (2) 20 litres (3) 18 litres (4) 30 litres (5) None of these
21. 56 litres of a mixture contains milk and water in the ratio 5 : 2. How much water is to be added to get a new mixture containing milk and water in the ratio 5 : 3?
 (1) 9 litres (2) 6 litres (3) 7 litres (4) 8 litres (5) None of these
22. 36 litres of a mixture contains milk and water in the ratio 2 : 1. How much water is to be added to get a new mixture containing milk and water in the ratio 1 : 1?
 (1) 12 litres (2) 16 litres (3) 8 litres (4) 15 litres (5) None of these
23. 25 litres of a mixture contains milk and water in the ratio 3 : 2. How much water is to be added to get a new mixture containing milk and water in the ratio 3 : 4?
 (1) 12 litres (2) 8 litres (3) 10 litres (4) 14 litres (5) None of these
24. Three equal glasses are filled with mixtures of milk and water. The proportion of milk and water in each glass is as follows. In the first glass as 3:1, in the second glass as 5:3 and in the third as 9:7. The contents of the three glasses are emptied into a single vessel. What is the proportion of milk and water in it?
 (1) 31:17 (2) 17:31 (3) 15:31 (4) 31:15 (5) None of these
25. Four vessels of equal sizes contain mixture of spirit and water. The concentration of spirit in 4 vessels are 60%, 70%, 75% and 80% respectively. If all the four mixtures are mixed, find in the resultant mixture the ratio of spirit to water.
 (1) 57:13 (2) 23:57 (3) 57:23 (4) 57:17 (5) None of these
26. Two casks of 48 and 42 litres are filled with mixtures of wine and water, the proportions in the two casks being respectively 13:7 and 18:17. If the contents of the two casks be mixed, and 20 litres of water added to the whole what will be the proportion of wine to water in the result?
 (1) 13:12 (2) 12:13 (3) 21:31 (4) 31:21 (5) None of these
27. Three glasses of capacity 2 litres, 5 litres and 9 litres contain mixture of milk and water with milk concentrations 90%, 80% and 70% respectively. The contents of three glasses are emptied into a large vessel. Find the milk concentration and ratio of milk to water in the resultant mixture.
 (1) 121:39 (2) 131:49 (3) 39:121 (4) 49:131 (5) None of these
28. In an alloy, zinc and copper are in the ratio 3 : 4. In the second alloy the same elements are in the ratio 4 : 5. In what ratio should these two alloys be mixed to form a new alloy in which the two elements are in ratio 7 : 3?
 (1) 161 : 181 (2) 171 : 181 (3) 161 : 171 (4) Not possible (5) None of these
29. A vessel is filled with a liquid, 3 parts of which are water and 5 parts syrup. How much of the mixture must be drawn off and replaced with water so that the mixture may be half water and half syrup?
 (1) $\frac{1}{5}$ (2) $\frac{1}{7}$ (3) $\frac{4}{5}$ (4) $\frac{3}{10}$ (5) None of these
30. A cask contains 3 parts ale and 1 part porter. How much of the mixture must be drawn off and porter substituted in order that the resulting mixture may be half and half?
 (1) $\frac{1}{3}$ (2) $\frac{1}{2}$ (3) $\frac{1}{5}$ (4) $\frac{2}{3}$ (5) None of these
31. How much chicory at ₹ 24 a kg should be added to 15 kg of tea at ₹ 60 a kg, as to make the mixture worth ₹ 39 a kg?
 (1) 21 kg (2) 20 kg (3) 27 kg (4) 18 kg (5) None of these
32. One type of liquid contains 15% of milk, the other contains 20% of milk. A can is filled with 4 parts of the first liquid and 11 parts of the second liquid. Find the percentage of milk in the new mixture.
 (1) $18\frac{1}{3}\%$ (2) 18% (3) $18\frac{2}{3}\%$ (4) $18\frac{3}{8}\%$ (5) None of these
33. An 25-litres cylinder contains a mixture of oxygen and nitrogen, the volume of oxygen being 25% of total volume. A few litres of the mixture is released and an equal amount of nitrogen is added. Then the same amount of the mixture as before is released and replaced by nitrogen for the second time. As a result, the oxygen content becomes 9% of the total volume. How many litres of mixture is released each time?
 (1) 15 litres (2) 10 litres (3) 14 litres (4) 18 litres (5) None of these
 (77)

34. From a cask of wine, containing 64 litres, 8 litres are drawn out and the cask is filled up with water. If the same process is repeated a second, then a third time, what will be the proportion of wine to water in the resulting mixture?
 (1) 343 : 169 (2) 343 : 512 (3) 169 : 343 (4) 512 : 343 (5) None of these
35. A vessel contains 24 litres of milk. 4 litres are withdrawn and replaced by water. The process is repeated a second time. Find the ratio of milk to water in the resulting mixture?
 (1) 25 : 36 (2) 36 : 11 (3) 11 : 25 (4) 25 : 11 (5) None of these
36. Eight litres are drawn off from a vessel full of water and substituted by pure milk. Again eight litres of the mixture are drawn off and substituted by pure milk. If the vessel now contains water and milk in the ratio 9 : 40, find the capacity of the vessel.
 (1) 14 litres (2) 24 litres (3) 16 litres (4) 12 litres (5) None of these
37. Ten litres of wine are drawn from a vessel full of wine. It is then filled up with water. Ten litres of the mixture are drawn and the vessel is again filled up with water. The ratio of the quantity of wine now left in the vessel is to that of the water in it as 144:25. Find the capacity of the vessel.
 (1) 135 litres (2) 120 litres (3) 130 litres (4) 140 litres (5) None of these
38. There are two vessels of equal capacity, one full of milk, and the second one-third full of water. The second vessel is then filled up out of the first, the contents of the second are then poured back into the first till it is full and then again the contents of the first are poured back into the second till it is full. What is the proportion of milk in the second vessel?
 (1) Cannot possible (2) $\frac{20}{27}$ (3) $\frac{20}{37}$ (4) $\frac{7}{27}$ (5) None of these

ANSWER

ALLIGATION

1.3	2.4	3.1	4.1	5.4	6.1	7.1	8.1	9.3	10.1	11.1	12.1	13.1	14.2
15.3	16.1	17.2	18.3	19.1	20.3	21.4	22.1	23.3	24.1	25.3	26.2	27.1	28.4
29.1	30.1	31.1	32.3	33.2	34.1	35.4	36.1	37.3	38.2				

AVERAGE

1. If a, b, c, d, e are five consecutive odd integers, then what is their average?
- (1) $a + 4$ (2) $\frac{abcde}{5}$ (3) $5(a+b+c+d+e)$ (4) $a + 8$ (5) None of these
2. The average salary of 20 workers in an office is ₹ 1900 per month. If the manager's salary is added, the average becomes ₹ 2000 per month. The manager's annual salary (in ₹) is:
- (1) 4000 (2) 25200 (3) 45600 (4) 84000 (5) None of these
3. In a coconut grove, $(x + 2)$ trees yield 60 nuts per year per tree, x trees yield 120 nuts per year per tree and $(x - 2)$ trees yield 180 nuts per year per tree. If the average yield per year per tree be 100, find x .
- (1) 4 (2) 2 (3) 8 (4) 6 (5) None of these
4. In a certain primary school, there are 60 boys of age 12 each, 40 of age 13 each, 50 of age 14 each and 50 of age 15 each. The average age (in years) of the boys of the school is:
- (1) 13.50 (2) 13 (3) 13.45 (4) 14 (5) None of these
5. The average age of 24 students and the class teacher is 16 years. If the class teacher's age is excluded, the average reduces by 1 year. What is the age of the class teacher?
- (1) 50 years (2) 45 years (3) 40 years (4) Data inadequate (5) None of these
6. The average of 8 numbers is 14. If 2 is subtracted from each given number, what will be the new average?
- (1) 12 (2) 10 (3) 16 (4) 18 (5) None of these
7. The average of x numbers is $3x$. If $x - 1$ is subtracted from each given number, what will be the new average?
- (1) $2x + 1$ (2) $3(x - 1)$ (3) $2x - 1$ (4) Data inadequate (5) None of these
8. The average age of 34 boys in a class is 14 years. If the teacher's age is included the average age of the boys and the teacher becomes 15 years. What is the teacher's age?
- (1) 48 years (2) 46 years (3) 49 years (4) 45 years (5) None of these
9. The average of 40 numbers is 405. If each of the numbers is divided by 15, find the average of new set of numbers.
- (1) 27 (2) 28 (3) 21 (4) 26 (5) None of these
10. The average of 8 numbers is 21. If each of the numbers is multiplied by 8, find the average of new set of numbers.
- (1) 168 (2) 167 (3) 158 (4) 161 (5) None of these
11. The average weight of 8 persons increases by 1.5 kg. If a person whose weight is 65 kg is replaced by a new person, what could be the weight of the new person?
- (1) 76 kg (2) 77 kg (3) 76.5 kg (4) Data inadequate (5) None of these
12. In a class there are 24 boys whose average age is decreased by 3 months, when 1 boy aged 20 years is replaced by a new boy. Find the age of the new boy.
- (1) 14 years (2) 16 years (3) 17 years (4) 18 years (5) None of these
13. The average of marks obtained by 77 candidates in a certain examination is 17. If the average marks of passed candidates is 19 and that of the failed candidates is 8, what is the number of candidates who passed the examination?
- (1) 36 (2) 65 (3) 40 (4) 70 (5) None of these
14. The average of 13 results is 39, that of the first five is 38 and that of the last seven is 36. Find the value of the 6th number.
- (1) 64 (2) 46 (3) 65 (4) 56 (5) None of these
15. A batsman in his 10th innings makes a score of 92 and thereby increases his average by 4. What is his average after 16 innings?
- (1) 32 (2) 30 (3) 34 (4) 23 (5) None of these
16. A batsman, in his 19th innings, missed a century by 2 runs and thereby increases his average by 3. What is his average after 19 innings.
- (1) 50 (2) 44 (3) 45 (4) 43 (5) None of these
17. A constant distance from A to B is covered by a man at 40 km/hr. The person rides back the same distance at 30 km/hr. Find his average speed during the whole journey.
- (1) 34 km/hr (2) 35.29 km/hr (3) 34.5 km/hr (4) 35 km/hr (5) $34\frac{2}{7}$ km/hr
18. A person divides his total route of journey into three equal parts and decides to travel the three parts with speeds of 20, 15 and 10 km/hr respectively. Find his average speed during the whole journey.
- (1) $13\frac{11}{13}$ km/hr (2) $11\frac{11}{13}$ km/hr (3) $13\frac{3}{13}$ km/hr (4) $11\frac{3}{13}$ km/hr (5) None of these

19. A person covers 18 km at 6 km/hr, 16 km at 8 km/hr and 30 km at 6 km/hr. Then find the average speed in covering the whole distance.
 (1) 6.5 km/hr (2) 6.4 km/hr (3) 6.2 km/hr (4) 6 km/hr (5) None of these
20. A person runs the first $\frac{1}{4}$ th of the distance at 8 km/hr, the next $\frac{3}{5}$ th at 6 km/hr and the remaining distance at 10 km/hr. Find his average speed.
 (1) 17 km/hr (2) 17.87 km/hr (3) 17.78 km/hr (4) 18.5 km/hr (5) $6\frac{98}{117}$ km/hr
21. The average salary of the entire staff in a office is ₹ 130 per month. The average salary of officers is ₹ 540 and that of non-officers is ₹ 114. If the number of officers is 16, then find the number of non-officers in the office.
 (1) 140 (2) 410 (3) 510 (4) 150 (5) None of these
22. There were 42 students in a hostel. If the number of students increases by 7, the expenses of the mess increase by ₹ 32.5 per day while the average expenditure per head diminishes by ₹ 1.5. Find the original expenditure of the mess.
 (1) ₹ 636 (2) ₹ 536 (3) ₹ 630 (4) ₹ 656 (5) None of these
23. There were 36 students in a hostel. If the number of students increases by 4, the expenses of the mess increase by ₹ 32 per day while the average expenditure per head diminishes by Re 1. Find the original expenditure of the mess.
 (1) ₹ 640 (2) ₹ 648 (3) ₹ 650 (4) ₹ 658 (5) None of these
24. The average of Suresh's marks in English and History is 55. His average of marks in English and Science is 65. What is the difference between the marks which he obtained in History and Science?
 (1) 40 (2) 60 (3) 20 (4) Data inadequate (5) None of these
25. The average marks scored by Ganesh in English, Science, Mathematics and History is less than 15 from that scored by him in English, History, Geography and Mathematics. What is the difference of marks in Science and Geography scored by him?
 (1) 40 (2) 50 (3) 60 (4) Data inadequate (5) None of these
26. The average temperature for Monday, Tuesday and Wednesday was 40°C . The average for Tuesday, Wednesday and Thursday was 41°C . That for Thursday being 42°C , what was the temperature on Monday?
 (1) 39°C (2) 45°C (3) 44°C (4) 40°C (5) None of these
27. The average attendance of a college for the first three days of a week is 325, and for first four days it is 320. How many were present on the fourth day?
 (1) 305 (2) 350 (3) 330 (4) 503 (5) None of these
28. A car runs for t_1 hours at v_1 km/hr, t_2 hours at v_2 km/hr. What is the average speed of the car for the entire journey?
 (1) $\frac{t_1 + t_2}{v_1 t_1 + v_2 t_2}$ km/hr (2) $\frac{v_1 t_1 + v_2 t_2}{t_1 + t_2}$ km/hr (3) $\frac{v_1 t_2 + v_2 t_1}{v_1 + v_2}$ km/hr
 (4) $\frac{v_1 + v_2}{v_1 t_1 + v_2 t_2}$ km/hr (5) None of these
29. A car runs x km at an average speed of v_1 km/hr and y km at an average speed of v_2 km/hr. What is the average speed of the car for the entire journey?
 (1) $\frac{v_1 v_2 (x+y)}{x v_2 + y v_1}$ km/hr (2) $\frac{x v_2 + y v_1}{v_1 v_2 (x+y)}$ km/hr (3) $\frac{x y (v_1 + v_2)}{x v_1 + y v_2}$ km/hr
 (4) $\frac{x y}{(v_1 + v_2)}$ km/hr (5) None of these
30. An aeroplane covers the four sides of square field at speeds of 200, 400, 600 and 800 km/hr. Then the average speed of the plane in the entire journey is
 (1) 600 km/hr (2) 400 km/hr (3) 500 km/hr (4) 384 km/hr (5) None of these
31. The average age of the three boys is 15 years. Their ages are in the ratio 3:5:7. Then the age of the oldest is
 (1) 7 years (2) 14 years (3) 20 years (4) 21 years (5) None of these
32. The population of a town increased by 20% during the first year, by 25% during the next year and by 44% during the third year. Find the average rate of increase during 3 years.
 (1) 36.87% (2) 37.68% (3) $38\frac{2}{3}\%$ (4) 40% (5) None of these

33. An investor earns 3% return on $\frac{1}{4}$ th of his capital, 5% on $\frac{2}{3}$ rd and 11% on the remainder. What is the average rate of return he earns on his total capital?

(1) 5% (2) 10% (3) 5.5% (4) 10.5% (5) None of these

34. The average of 8 readings is 24.3, out of which the average of first two is 18.5 and that of next three is 21.2. If the sixth reading is 3 less than seventh and 8 less than eighth, what is the sixth reading?

(1) 24.8 (2) 26.5 (3) 27.6 (4) 29.4 (5) None of these

35. The average age of a family of 6 members is 22 years. If the age of the youngest member be 7 years, the average age of the family at the birth of the youngest member, was

(1) 15 years (2) 17 years (3) 17.5 years (4) 18 years (5) None of these

36. The average age of a husband and wife was 23 years when they were married 5 years ago. The average age of the husband, the wife and a child who was born during the interval, is 20 years now. How old is the child now?

(1) 9 months (2) 1 year (3) 3 years (4) 4 years (5) None of these

37. 5 years ago, the average age of A, B, C and D was 45. With E joining them now, the average age of all the five is 49 years. How old is E?

(1) 25 years (2) 40 years (3) 45 years (4) 64 years (5) None of these

38. The average height of 40 students is 163 cm. On a particular day, three students A, B, C were absent and the average of the remaining 37 students was found to be 162 cm. If A, B have equal heights and the height of C be 2 cm less than that of A, find the height of A.

(1) 176 cm (2) 166 cm (3) 180 cm (4) 186 cm (5) None of these

39. Out of three numbers, the first is twice the second and is half of the third. If the average of the three numbers is 56, the three numbers in order are:

(1) 48, 96, 24 (2) 48, 24, 96 (3) 96, 24, 48 (4) 96, 48, 24 (5) None of these

40. The average weight of 3 men A, B and C is 84 kg. Another man D joins the group and the average now becomes 80 kg. If another man E, whose weight is 3 kg more than that of D, replaces A, then average weight of B, C, D and E becomes 79 kg. The weight of A is:

(1) 70 kg (2) 72 kg (3) 75 kg (4) 80 kg (5) None of these

41. The average age of A and B is 20 years. If C were to replace A, the average would be 19 and if C were to replace B, the average would be 21. What are the ages of A, B and C respectively?

(1) 22, 18, 20 (2) 18, 22, 20 (3) 22, 20, 18 (4) 18, 20, 22 (5) 24, 20, 22

ANSWER

AVERAGE

AVERAGE	1.1	2.5	3.1	4.3	5.3	6.	7.1	8.3	9.1	10.1	11.2	12.1	13.2	14.3
15.1	16.2	17.5	18.1	19.2	20.5	21.2	22.1	23.2	24.3	25.3	26.1	27.1	28.2	
29.1	30.4	31.4	32.3	33.1	34.3	35.4	36.4	37.3	38.1	39.2	40.3	41.1		

1.1; Suppose the numbers are

$$a, a+2, a+4, a+6 \text{ and } a+8$$

Now, the average of the five numbers.

$$= \frac{a+(a+8)}{2} = \frac{2a+8}{2} = a+4$$

2.5; Here, Manager's monthly salary

$$= 2000 \times 21 - 1900 \times 20 = 4000$$

Hence, the required annual salary

$$= 4000 \times 12 = ₹ 48,000.$$

3.1. We have,

$$\frac{60(x+2) + 120x + 180(x-2)}{x+2+x+x-2} = 100$$

$$\text{or, } \frac{60x + 120 + 120x + 180x - 360}{3x} = 100$$

$$\text{or, } 360x + 120 - 360 = 300x$$

$$\text{or, } 60x = 240$$

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

4.3; Required average age

$$\begin{aligned} &= \frac{60 \times 12 + 40 \times 13 + 50 \times 14 + 50 \times 15}{60 + 40 + 50 + 50} \\ &= \frac{720 + 520 + 700 + 750}{200} = \frac{2690}{200} = 13.45 \end{aligned}$$

5.3; The class teacher's age

$$= 25 \times 16 - 24 \times 15$$

$$= 400 - 360 = 40 \text{ years}$$

6.1; Required new average

$$= \text{Old average} - \frac{1}{2} = 14 - 2 = 12$$

7.1; Required new average

$$= \text{Old average} - (x-1)$$

$$= 3x - (x-1) = 3x - x + 1 = 2x + 1$$

8.3; The teacher's age = $35 \times 15 - 34 \times 14$

$$= 525 - 476 = 49 \text{ years}$$

9.1; Required new average = Old average $\div 15$

$$= 405 \div 15 = 27$$

10.1; Required new average = Old average $\times 8$

$$= 21 \times 8 = 168$$

11.2; Required weight of the new person

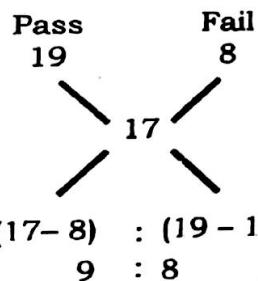
$$= 65 + (8 \times 1.5) = 65 + 12 = 77 \text{ kgs.}$$

12.1; Required the age of the new boy

$$= 20 \text{ years} - (24 \times 3) \text{ months}$$

$$= 20 \text{ years} - 6 \text{ years} = 14 \text{ years}$$

13.2;



Hence, the required number of students who

$$\text{passed} = \frac{9}{(9+8)} \times 77 = 63$$

14.3; The required value of 6th result

$$= 39 \times 13 - 38 \times 5 - 36 \times 7$$

$$= 507 - 190 - 252 = 65$$

15.1; Suppose the average run after 15th innings was

Then, according to the given information.

$$\frac{15x + 92}{16} = x + 4$$

$$\text{or, } 15x + 92 = 16x + 64$$

$$\text{or, } 16x - 15x = 92 - 64$$

$$\therefore x = 28$$

Hence, average run after 16th innings

$$= 28 + 4 = 32$$

16.2; Suppose the average run after 18th innings was x .

Then, we have

$$\frac{18x + 98}{19} = x + 3$$

$$\text{or, } 18x + 98 = 19x + 3 \times 19$$

$$\text{or, } 19x - 18x = 98 - 57 = 41$$

Hence, the required average = $41 + 3 = 44$

17.5; Suppose total distance between A and B is 120 kms.

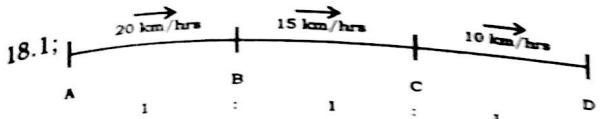
[∴ LCM of 30 and 40 is 120]

Now, we know

$$\text{Average speed} = \frac{\text{Total Distance}}{\text{Total Time}}$$

$$= \frac{120+120}{\frac{120}{30} + \frac{120}{40}} = \frac{240}{7}$$

$$= 34\frac{2}{7} \text{ km/hr.}$$



Suppose the distance of one of the three equal parts is 60 km.

[∴ LCM of 20, 15 and 10 is 60]

Now, the average speed

$$\begin{aligned} &= \frac{\text{Total Distance}}{\text{Total Time}} \\ &= \frac{60 + 60 + 60}{\frac{60}{20} + \frac{60}{15} + \frac{60}{10}} \\ &= \frac{180}{3+4+6} = \frac{180}{13} = 13\frac{11}{13} \text{ km/hr} \end{aligned}$$

19.2; Required average speed

$$= \frac{18 + 16 + 30}{\frac{18}{6} + \frac{16}{8} + \frac{30}{6}} = \frac{64}{10} = 6.4 \text{ km/hr}$$

20.5; Suppose, the total distance is 200 km

<u>Distance</u>	<u>Speed</u>
$200 \times \frac{1}{4} = 50 \text{ km}$	8 km/hr
$200 \times \frac{3}{5} = 120$	6 km/hr

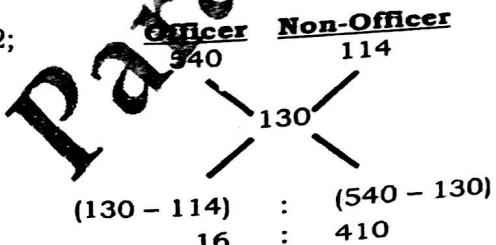
Remaining distance

$$200 - (120 + 50) = 30 \text{ km}$$

Now, the required average speed

$$\begin{aligned} &= \frac{50 + 120 + 30}{\frac{50}{8} + \frac{120}{6} + \frac{30}{10}} = \frac{200}{29\frac{1}{4}} \\ &= \frac{200 \times 4}{117} = \frac{98}{117} \text{ km/hr} \end{aligned}$$

21.2;



Now, it is obvious that if there are 16 officers then the number of non-officer is 410.

22.2; Suppose per student per day expenditure of mess = ₹ x.

Now, we have

$$\frac{(42x + 32.5)}{42+7} = x - 1.5$$

$$\text{or, } 42x + 32.5 = 49x - 1.5 \times 49$$

$$7x = 49 \times 1.5 + 32.5$$

$$\text{or, } x = \frac{49 \times 1.5 + 32.5}{7}$$

$$= \frac{73.5 + 32.5}{7} = \frac{106.0}{7}$$

Hence, original expenditure = 42x

$$= \frac{42 \times 106}{7} = 636$$

23.2; Suppose per student per day expenditure is ₹ x

Now, we have

$$\frac{36x + 1}{36+4} = x - 1$$

$$\text{or, } 36x + 32 = 40x - 40$$

$$40x + 36x = 40 + 32$$

$$\text{or, } 4x = 72$$

$$\text{or, } x = \frac{72}{4} = 18$$

Hence, original expenditure = 36x

$$= 36 \times 18 = ₹ 648$$

24.3; Marks obtained by Suresh in

$$\text{English + History} = 55 \times 2 = 110 \dots (\text{i})$$

$$\text{English + Science} = 65 \times 2 = 130 \dots (\text{ii})$$

From (i) and (ii) we get,

$$\text{Science - History} = 130 - 110 = 20$$

25.3; We have,

$$\frac{E + H + G + M}{4} - \frac{E + S + M + H}{4} = 15$$

$$\text{or, } \frac{E + H + G + M - E - S - M - H}{4} = 15$$

$$\text{or, } \frac{G - S}{4} = 15$$

$$G - S = 15 \times 4 = 60$$

26.1; We have,

$$\text{Mon} + \text{Tue} + \text{Wed}$$

$$= 40 \times 3 = 120^\circ\text{C}$$

..... (i)

$$\text{Tue} + \text{Wed} + \text{Thu}$$

$$= 41 \times 3 = 123^\circ\text{C}$$

..... (ii)

From (i) and (ii), we get,

$$\text{Thu} - \text{Mon} = 123^\circ - 120^\circ = 3^\circ\text{C}$$

$\therefore \text{Mon} - \text{Thu} = 3^\circ \text{C} = 42^\circ \text{C} - 3^\circ \text{C} = 39^\circ \text{C}$

27.1; The attendance on 4th day
 $= 320 \times 4 - 325 \times 3 = 1280 - 975 = 305$

28.2; Average speed = $\frac{\text{Total Distance}}{\text{Total Time}}$
 $= \frac{v_1 t_1 + v_2 t_2}{t_1 + t_2}$

$\because \text{Distance} = \text{speed} \times \text{time}$

29.1; $= \frac{x+y}{\frac{x}{v_1} + \frac{y}{v_2}} = \frac{v_1 v_2 (x+y)}{v_2 x + v_1 y}$

30.4; Suppose the side of the square is 2400 km.

$\because \text{LCM of } 200, 400, 600 \text{ and } 800 \text{ is } 2400 \text{ kms}$

Now, the average speed

$$\begin{aligned} &= \frac{\text{Total Distance}}{\text{Total Time}} \\ &= \frac{2400 \times 4}{\left(\frac{2400}{200} + \frac{2400}{400} + \frac{2400}{600} + \frac{2400}{800} \right)} \\ &= \frac{9600}{25} = 384 \text{ km/hr} \end{aligned}$$

31.4; Required age of oldest boy = $\frac{7 \times 15 \times 5}{(3+5+7)} = 21 \text{ years}$

32.3; Suppose the initial population was 100.

After three years population would be

$$100 \times \frac{120}{100} \times \frac{125}{100} \times \frac{144}{100} = 216$$

Hence, overall percentage increase in population during the three years

$$216 - 100 = 116\%$$

Now, the average rate of increase

$$\frac{116}{3} = 38\frac{2}{3}\%$$

33.1; Suppose total capital is ₹ 1200.

Parts of Capital	Rate	Return
I. $\frac{1}{4} \times 1200 = 200$	3%	₹ 9
II. $\frac{2}{3} \times 1200 = 200$	5%	₹ 40
III. Remaining = 100	11%	₹ 11 ₹ 60

Hence, rate of return = $\frac{60}{1200} \times 100 = 5 \text{ i.e. } 5\%$

34; Here, sum of the 6th, 7th and 8th reading
 $= 24.3 \times 8 - 18.5 \times 2 - 21.2 \times 3$
 $= 194.4 - 37 - 63.6 = 93.8$

Suppose, the 6th reading is x then 7th reading is $(x+3)$ whereas 8th reading is $(x+6)$

Now, according to the given information,

$$x + x + 3 + x + 6 = 93.8$$

$$3x + 11 = 93.8$$

$$3x = 82.8$$

$$\therefore x = \frac{82.8}{3} = 27.6$$

35.4; Total age of 6 members of the family
 $= 22 \times 6 = 132 \text{ years}$

Seven years before the sum of the ages of family member was $132 - 7 \times 6 = 90 \text{ years}$

Hence, required average age = $\frac{90}{5} = 18 \text{ years}$

36.4; At present average age of husband and wife is $(23 + 5) = 28 \text{ years}$

Sum of the ages of husband and wife is $(28 \times 2) = 56 \text{ years}$

Sum of the ages of husband, wife and child = $20 \times 3 = 60 \text{ years}$

Hence, the child's age = $60 - 56 = 4 \text{ years}$

37.3; At present, average age of A, B, C and D is $(45 + 5) = 50 \text{ years}$.

Sum of the ages of A, B, C and D is $(50 \times 4) = 200 \text{ years}$.

Sum of the ages of A, B, C, D and E is $(49 \times 5) = 245 \text{ years}$.

Now, E's age = $245 - 200 = 45 \text{ years}$

38.1; Total height of 40 students = $163 \times 40 = 6520 \text{ cm}^2$

Sum of the height of A, B and C is

$$= 6520 - 37 \times 162 = 6520 - 5994 = 526 \text{ cm}^2$$

According to the given questions,

Height of B = Height of A

Height of C = Height of A - 2 cms

Now, We have A + B + C = 526 cms

$$A + A + A - 2 = 526 \text{ cms}$$

$$3A = 528 \text{ cms}$$

$$\therefore A = \frac{528}{3} = 176 \text{ cms}$$

39.2; Suppose the numbers are N_1 , N_2 and N_3 .
We have,

$$\begin{array}{ccc} N_1 & : & N_2 & : & N_3 \\ 2 & : & 1 & : & 4 \end{array}$$

Also,

$$N_1 + N_2 + N_3 = 56 \times 3 = 168$$

$$\therefore N_1 = \frac{2}{7} \times 168 = 48; \quad N_2 = \frac{1}{7} \times 168 = 24; \quad N_3 = \frac{4}{7} \times 168 = 96$$

24

$$\text{And } N_3 = \frac{4}{7} \times 168 = 96$$

$$40.3; A + B + C = 84 \times 3 = 252 \text{ kg} \quad \dots \dots \dots \text{(i)}$$

$$A + B + C + D = 80 \times 4 = 320 \text{ kg} \quad \dots \dots \dots \text{(ii)}$$

$$\therefore \text{D's weight} = 320 - 252 = 68 \text{ kgs}$$

$$\text{E's weight} = 68 + 3 = 71 \text{ kgs}$$

Also,

$$\begin{aligned} E + B + C + D &= 79 \times 4 \\ &= 316 \text{ kgs} \quad \dots \dots \dots \text{(iii)} \end{aligned}$$

From (i) and (iii), we get,

$$A - E = 320 - 316 = 4 \text{ kgs}$$

$$A = 4 + E$$

$$= 4 + 71$$

$$= 75 \text{ kgs}$$

We have

$$A + B = 20 \times 2 = 40 \text{ years}$$

$$B + C = 19 \times 2 = 38 \text{ years}$$

$$A + C = 21 \times 2 = 42 \text{ years}$$

$$\underline{2(A + B + C) = 120 \text{ years}}$$

$$\text{Thus, } A + B + C = 120 \div 2 = 60 \text{ years}$$

$$\begin{aligned} \text{A's age} &= (A + B + C) - (B + C) \\ &= 60 - 38 = 22 \text{ years} \end{aligned}$$

$$\begin{aligned} \text{B's age} &= (A + B + C) - (A + C) \\ &= 60 - 42 = 18 \text{ years} \end{aligned}$$

$$\begin{aligned} \text{C's age} &= (A + B + C) - (A + B) \\ &= 60 - 40 = 20 \text{ years} \end{aligned}$$

PARTNERSHIP

- 1 A starts a business with ₹ 1000. B joins him after 6 months with ₹ 4000. C puts a sum of ₹ 5000 for 4 months only. At the end of the year the business gave a profit of ₹ 2800. How should the profit be divided among them?
 (1) ₹ 600, ₹ 1200, ₹ 1000 (2) ₹ 800, ₹ 600, ₹ 1400 (3) ₹ 1000, ₹ 1200, ₹ 600
 (4) ₹ 1200, ₹ 600, ₹ 1000 (5) None of these
- 2 A and B enter into a partnership for a year. A contributes ₹ 3000 and B ₹ 4000. After 4 months they admit C, who contributes ₹ 4500. If B withdraws his contribution after 6 months, how would they share a profit of ₹ 1000 at the end of the year?
 (1) ₹ 250, ₹ 200, ₹ 550 (2) ₹ 150, ₹ 200, ₹ 650 (3) ₹ 375, ₹ 350, ₹ 375
 (4) Data inadequate (5) None of these
- 3 A, B and C enter into a partnership. A advances one-third of the capital for one-third of the time. B contributes one-sixth of the capital for one-third of the time C contributes the remaining capital for the whole time. How should they divide a profit of ₹ 1200.
 (1) ₹ 300, ₹ 200, ₹ 700 (2) ₹ 200, ₹ 100, ₹ 900 (3) ₹ 375, ₹ 250, ₹ 575
 (4) ₹ 385, ₹ 255, ₹ 475 (5) None of these
- 4 Manoj got ₹ 6000 as his share out of the total profit of ₹ 9000 which he and Ramesh earned at the end of one year. If Manoj invested ₹ 20000 for 6 months, whereas Ramesh invested his amount for the whole year, the amount invested by Ramesh was
 (1) ₹ 60000 (2) ₹ 10000 (3) ₹ 40000 (4) ₹ 5000 (5) None of these
- 5 A and B enter into partnership investing ₹ 12000 and ₹ 16000 respectively. After 8 months, C also joins the business with a capital of ₹ 15000. The share of C in a profit of ₹ 45600 after 2 years will be
 (1) ₹ 12000 (2) ₹ 14400 (3) ₹ 19200 (4) ₹ 21200 (5) None of these
- 6 Kishan and Nandan started a joint firm. Kishan's investment was thrice the investment of Nandan and the period of his investment was two times the period of investment of Nandan. Nandan got ₹ 4000 as profit for his investment. Their total profit if the distribution of profit is directly proportional to the period and amount, is
 (1) ₹ 24000 (2) ₹ 16000 (3) ₹ 28000 (4) ₹ 20000 (5) None of these
- 7 A and B enter into a partnership with their capitals in the ratio 5 : 9. At the end of 8 months, A withdraws his capital. If they receive the profits in the ratio 4 : 9, find how long B's capital was used?
 (1) 10 months (2) 9 months (3) 8 months (4) 4 months (5) None of these
- 8 A started a business by investing ₹ 2700. After sometime B joined him by investing ₹ 2025. At the end of one year, the profit was divided in the ratio 2 : 1. After how many months did B join the business?
 (1) 4 months (2) 6 months (3) 3 months (4) 2 months (5) None of these
- 9 A, B and C invested in the ratio 1 : 2 : 3; the timing of their investments being in the ratio 1 : 2 : 3. In what ratio would their profit be distributed?
 (1) 3 : 2 : 1 (2) 1 : 2 : 3 (3) 1 : 4 : 9 (4) 9 : 4 : 1 (5) None of these
- 10 A, B and C invested in the ratio 2 : 5 : 7; the timing of their investments being in the ratio 3 : 4 : 5. In what ratio would their profit be distributed?
 (1) 2 : 10 : 1 (2) 15 : 10 : 2 (3) 6 : 20 : 35 (4) 6 : 20 : 15 (5) None of these
- 11 A, B and C invested capitals in the ratio 4 : 5 : 6. At the end of the business term, they received the profits in the ratio 2 : 3 : 4. Find the ratio of time for which they contributed their capitals.
 (1) 6 : 5 : 8 (2) 6 : 5 : 9 (3) 10 : 12 : 9 (4) 15 : 18 : 20 (5) None of these
- 12 A, B and C invested capitals in the ratio 4 : 6 : 9. At the end of the business term, they received the profits in the ratio 2 : 3 : 5. Find the ratio of time for which they contributed their capitals.
 (1) 1 : 1 : 9 (2) 2 : 2 : 9 (3) 10 : 10 : 9 (4) 9 : 9 : 10 (5) None of these
- 13 A, B and C invest their capitals in a business. If the ratio of their periods of investments are 2 : 3 : 6 and their profits are in the ratio of 4 : 5 : 6. Find the ratio in which the investments are made by A, B and C.
 (1) 9 : 10 : 12 (2) 4 : 5 : 6 (3) 8 : 5 : 12 (4) 6 : 5 : 3 (5) None of these
- 14 A, B and C invest their capitals in a business. If the ratio of their periods of investments are 7 : 3 : 5 and their profits are in the ratio of 2 : 1 : 2. Find the ratio in which the investments are made by A, B and C.
 (1) 30 : 35 : 42 (2) 7 : 6 : 10 (3) 42 : 30 : 35 (4) 42 : 25 : 35 (5) None of these

15. A, B and C are partners. A receives $\frac{2}{7}$ of the profit and B and C share the remaining profit equally. A's income is increased by ₹ 240 when the profit rises from 10% to 15%. Find the capitals invested by B and C each.
- (1) ₹ 2400 (2) ₹ 1200 (3) ₹ 4800 (4) ₹ 6000 (5) None of these
16. A, B and C are partners. A receives $\frac{5}{8}$ of the profit and B and C share the remaining profit equally. A's income is increased by ₹ 450 when the profit rises from 4% to 9%. Find the capitals invested by B and C each.
- (1) ₹ 3366 (2) ₹ 1687.5 (3) ₹ 3475 (4) ₹ 2700 (5) None of these
17. Two partners invest ₹ 26000 and ₹ 16250 respectively in a business and agree that 10% of the profit should be divided equally between them and the remaining profit is to be treated as interest on capital. If one partner gets ₹ 450 more than the other, find the total profit made in the business.
- (1) ₹ 3250 (2) ₹ 3520 (3) ₹ 3230 (4) ₹ 3200 (5) None of these
18. Two partners invest ₹ 17000 and ₹ 13000 respectively in a business and agree that 75% of the profit should be divided equally between them and the remaining profit is to be treated as interest on capital. If one partner gets ₹ 532 more than the other, find the total profit made in the business.
- (1) ₹ 16960 (2) ₹ 14960 (3) ₹ 16950 (4) ₹ 15560 (5) None of these
19. A and B invested in the ratio 5 : 3 in a business. If 10% of the total profit goes to charity and A's share is ₹ 900, find the total profit.
- (1) ₹ 1600 (2) ₹ 1400 (3) ₹ 1500 (4) ₹ 1800 (5) None of these
20. A and B invested in the ratio 4 : 9 in a business. If 8% of the total profit goes to charity and A's share is ₹ 460, find the total profit.
- (1) ₹ 2625 (2) ₹ 2526 (3) ₹ 1526 (4) ₹ 1625 (5) None of these
21. Three partners A, B and C together invested ₹ 14000 in a business. At the end of the year, A got ₹ 1250, B got ₹ 2500 and C got ₹ 3750 as profit. How much amount did C invest?
- (1) ₹ 2400 (2) ₹ 4800 (3) ₹ 7200 (4) ₹ 9600 (5) None of these
22. Three partners A, B and C together invested ₹ 36000 in a business. At the end of the year, A got ₹ 4200, B got ₹ 7000 and C got ₹ 9800 as profit. How much amount did B invest?
- (1) ₹ 7200 (2) ₹ 12000 (3) ₹ 16800 (4) ₹ 12500 (5) None of these
23. A puts ₹ 375 more in a business than B, but B has invested his capital for 4 months while A has invested his for 8 months. If the share of A is $\frac{1}{5}$ more than that of B out of the total profits of ₹ 125, find the capital contributed by B?
- (1) ₹ 750 (2) ₹ 775 (3) ₹ 735 (4) ₹ 573 (5) None of these
24. A puts ₹ 768 more in a business than B, but B has invested his capital for 7 months while A has invested his for 4 months. If the share of A is ₹ 42 more than that of B out of the total profits of ₹ 358, find the capital contributed by B.
- (1) ₹ 642 (2) ₹ 1400 (3) ₹ 632 (4) ₹ 462 (5) None of these
25. A and B invested ₹ 3000 and ₹ 4000 in a business. A receives ₹ 10 per month out of the profit as a remuneration for running the business and the rest of profit is divided in proportion to the investments. If in a year 'A' totally receives ₹ 390, what does B receive?
- (1) ₹ 330 (2) ₹ 360 (3) ₹ 480 (4) ₹ 380 (5) None of these
26. A sum of money is to be divided among A, B and C in the ratio 2 : 3 : 7. If the total share of A and B together is ₹ 1500 less than C, what is A's share in it?
- (1) ₹ 1000 (2) ₹ 1500 (3) ₹ 2000 (4) Data inadequate (5) None of these

ANSWER

PARTNERSHIP

1.1	2.3	3.2	4.4	5.1	6.3	7.1	8.1	9.3	10.3	11.4	12.4	13.4	14.1
15.4	16.4	17.1	18.4	19.1	20.4	21.3	22.2	23.2	24.3	25.2	26.2		

TIME AND WORK

1. 8 men can do a piece of work in 5 days. How many men are needed to complete the work in 10 days?
 (1) 8 men (2) 4 men (3) 2 men (4) 3 men (5) None of these
2. 20 men can prepare 40 toys in 24 days working 18 hours a day. Then in how many days can 36 men prepare 48 toys working 16 hrs a day?
 (1) 16 days (2) 12 days (3) 21 days (4) 18 days (5) None of these
3. A and B can finish a piece of work in 30 days, B and C in 40 days while C and A in 60 days. How long will they take to finish it together?
 (1) $26\frac{2}{3}$ days (2) $16\frac{2}{3}$ days (3) 25 days (4) 24 days (5) None of these
4. 10 men can complete a piece of work in 15 days and 15 women and complete the same work in 12 days. If all the 10 men and 15 women work together, in how many days will the work get completed?
 (1) 6 (2) $7\frac{2}{3}$ (3) $6\frac{2}{3}$ (4) $6\frac{1}{3}$ (5) None of these
5. A can do a piece of work in 5 days, B in 4 days and A, B and C together in 2 days. In what time would C do it alone?
 (1) 25 days (2) 12 days (3) 15 days (4) 20 days (5) None of these
6. A and B finish a job in 12 days while A, B and C can finish it in 8 days. C alone will finish the job in:
 (1) 20 days (2) 14 days (3) 24 days (4) 16 days (5) None of these
7. A, B and C together can finish a piece of work in 12 days, A and C together work twice as much as B, A and B together work thrice as much as C. In what time (in days) could each do it separately?
 (1) $28\frac{4}{5}, 42, 48$ (2) $28\frac{4}{5}, 36, 48$ (3) $28, 36, \frac{4}{5}, 48$ (4) 28, 36, 48 (5) None of these
8. If 3 men or 5 women can reap a field in 45 days, how long will 5 men and 6 women take to reap it?
 (1) 15 days (2) 25 days (3) 18 days (4) 12 days (5) None of these
9. If 2 men or 4 women can reap a field in 44 days, how long will 3 men and 5 women take to reap $\frac{3}{4}$ th of the field?
 (1) 10 days (2) 8 days (3) 12 days (4) 11 days (5) None of these
10. 10 children and 12 men complete a certain piece of work in 9 days. Each child takes twice the time by a man to finish the work. In how many days will 12 men finish the same work?
 (1) 8 (2) 9 (3) 12.75 (4) 15 (5) None of these
11. A certain number of men can do a work in 45 days. If there were 4 men less it could be finished in 15 days more. How many men are there?
 (1) 28 men (2) 16 men (3) 24 men (4) 20 men (5) None of these
12. A is twice as fast as B, and is therefore able to finish a work in 30 days less than B. Find the time in which they can do it working together.
 (1) 18 days (2) 20 days (3) 24 days (4) 22 days (5) None of these
13. I can finish a work in 16 days at 5 hrs a day. You can finish it in 12 days at 4 hrs a day. Find in how many days we can finish it working together 6 hrs a day.
 (1) 8 days (2) 4 days (3) 6 days (4) 7 days (5) None of these
14. A can do a work in 20 days. B takes 5 days to complete it. C takes as long as A and B would take working together. How long will it take A, B and C to complete the work together?
 (1) 2 days (2) 4 days (3) 3 days (4) 6 days (5) None of these
15. A and B together can do a piece of work in 7 days. If A does twice as much work as B in a given time, find how long A alone would take to do the work?
 (1) 21 days (2) 20 days (3) 10 days (4) $10\frac{1}{2}$ days (5) None of these
16. 8 men and 4 boys working together can do 6 times as much work per hour as a man and a boy together. Compare the work of a man with that of a boy.
 (1) 2 : 1 (2) 3 : 1 (3) 1 : 1 (4) 1 : 2 (5) None of these

17. A and B can together finish a work in 30 days. They worked for it for 20 days and then B left. The remaining work was done by A alone in 20 more days. A alone can finish the work in:
 (1) 54 days (2) 60 days (3) 48 days (4) 50 days (5) None of these
18. 2 men or 3 women or 4 boys can do a work in 52 days. Then in how many days will 1 man, 1 woman and 1 boy do the work?
 (1) 24 days (2) 42 days (3) 36 days (4) 48 days (5) None of these
19. 3 men or 4 women or 5 boys can do a work in 47 days. Then in how many days will 1 man, 1 woman and 1 boy do the work?
 (1) 40 days (2) 50 days (3) 60 days (4) 45 days (5) None of these
20. 1 man or 3 women or 4 boys can do a work in 38 days. Then in how many days will 1 man, 1 woman and 1 boy do the work?
 (1) 24 days (2) 12 days (3) 18 days (4) 36 days (5) None of these
21. A group of men can do a work in 15 days, but 2 of them became absent. If the rest of the group did the work in 25 days, find the original number of men.
 (1) 5 men (2) 4 men (3) 7 men (4) 6 men (5) None of these
22. A certain number of men can do a work in 50 days. If there were 3 men more it could be finished in 5 days less. How many men are there?
 (1) 36 men (2) 18 men (3) 27 men (4) 30 men (5) None of these
23. A builder decided to build a farmhouse in 45 days. He employed 150 men in the beginning and 120 more after 30 days and completed the construction in stipulated time. If he had not employed the additional men, how many days behind schedule would it have been finished?
 (1) 12 days (2) 10 days (3) 15 days (4) 8 days (5) None of these
24. A, B and C can do a piece of work in 10, 12 and 15 days respectively, they start working together but C leaves after working 3 days and B, 4 days before the completion of work. In how many days the work was finished?
 (1) $6\frac{2}{11}$ days (2) 7 days (3) $7\frac{2}{15}$ days (4) $6\frac{2}{5}$ days (5) None of these
25. A, B and C can do a piece of work in 5, 8 and 10 days respectively, they start working together but C leaves after working 2 days and B, 1 days before the completion of work. In how many days the work was finished?
 (1) 3 days (2) $3\frac{1}{17}$ days (3) $3\frac{2}{7}$ days (4) $2\frac{11}{13}$ days (5) None of these
26. There is a sufficient food for 300 men for 32 days. After 29 days, 210 men leave the place. For how many days will the rest of the food last for the rest of the men?
 (1) 12 days (2) 14 days (3) 15 days (4) 10 days (5) None of these
27. There is a sufficient food for 150 men for 15 days. After 10 days, 75 men leave the place. For how many days will the rest of the food last for the rest of the men?
 (1) 10 days (2) 8 days (3) 5 days (4) 15 days (5) None of these
28. A can do a certain work in the same time in which B and C together can do it. If A and B together could do it in 10 days, and C alone in 50 days, in what time could B alone do it?
 (1) 25 days (2) 30 days (3) 24 days (4) 20 days (5) None of these
29. A team of 20 men is supposed to do a work in 30 days. After 12 days, 5 more men were employed and the work finished 2 days earlier. In how many days would it have been finished if 5 more men were not employed?
 (1) 30 days (2) 28 days (3) 32 days (4) 34 days (5) None of these
30. A, B and C can do a piece of work in 12, 18 and 24 days respectively, they work at it together, A stops the work after 4 days and B is called off 2 days before the work is done. In what time was the work finished?
 (1) 12 days (2) 14 days (3) 16 days (4) 8 days (5) None of these
31. A started a work and left after working for 4 days. Then B was called and he finished the work in 18 days. Had A left the work after working for 6 days, B would have finished the remaining work in 12 days. In how many days can each of them, working alone, finish the whole work?
 (1) 5 days, 20 days (2) 10 days, 30 days (3) 15 days, 30 days (4) 5 days, 30 days (5) None of these
32. A can do a piece of work in 50 days and B in 40 days. They work together for 10 days and then A leaves B to finish the work alone. How long will B take to finish it?
 (1) 11 days (2) 18 days (3) 22 days (4) 26 days (5) None of these
33. 30 men, working 4 hours a day can do a piece of work in 10 days. Find the number of days in which 45 men working 8 hrs a day can do twice the work. Assume that 2 men of the first group do as much work in 2 hours as 4 men of the second group do in 1 hr.
 (1) $6\frac{1}{3}$ days (2) $6\frac{2}{3}$ days (3) $5\frac{3}{6}$ days (4) $3\frac{1}{6}$ days (5) None of these

34. A alone would take 27 hours more to complete the job than if both A and B would together. If B worked alone, he took 3 hours more to complete the job than A and B worked together. What time, would they take if both A and B worked together?
 (1) 8 hours (2) 10 hours (3) 9 hours (4) 6 hours (5) None of these
35. A and B together can do a piece of work in 12 days which B and C together can do in 16 days. After A has been working at it for 5 days, and B for 7 days. C finishes it in 13 days. In how many days could each do the work by himself?
 (1) 16, 48 and 26 days respectively (2) 16, 48 and 24 days respectively
 (3) 26, 48 and 24 days respectively (4) 16, 46 and 24 days respectively
 (5) None of these
36. Two women, Ganga and Jamuna, working separately can mow a field in 8 and 12 hours respectively. If they work for an hour alternately, Ganga beginning at 9 am, when will the mowing be finished?
 (1) 6:30 pm (2) 8:30 pm (3) 6:30am (4) 7: 30pm (5) None of these
37. A, B and C together can do a work in 4 days. A alone can do the work in 12 days and B alone can do the same work in 18 days. Find in what time C alone can do that work?
 (1) 8 days (2) 27 days (3) 9 days (4) 18 days (5) None of these
38. A, B and C together can do a work in 12 days. A alone can do the work in 36 days and B alone can do the same work in 54 days. Find in what time C alone can do that work?
 (1) 9 days (2) 18 days (3) 24 days (4) 27 days (5) None of these
39. A can complete a work in 35 days and B can do the same work in 28 days. If A after doing 10 days, leaves the work, find in how many days B will do the remaining work?
 (1) 25 days (2) 20 days (3) 27 days (4) 24 days (5) None of these
40. A can complete a work in 24 days and B can do the same work in 18 days. If A after doing 4 days, leaves the work, find in how many days B will do the remaining work?
 (1) 10 days (2) 12 days (3) 15 days (4) 16 days (5) None of these
41. A and B working together can do a piece of work in 6 days, B alone could do it in 8 days. Supposing B works at it for 5 days, in how many days A alone could finish the remaining work?
 (1) 9 days (2) 8 days (3) 6 days (4) 12 days (5) None of these
42. A and B can do a piece of work in 20 days and 30 days. Both starts the work together for some time, but B leaves the job 5 days before the work is completed. Find the time in which work is finished.
 (1) 7 days (2) 12 days (3) 14 days (4) 16 days (5) None of these

ANSWER

TIME AND WORK

1.2	2.4	3.1	4.3	5.4	6.3	7.2	8.1	9.3	10.3	11.2	12.2	13.1	14.1
15.4	16.3	17.2	18.4	19.3	20.4	21.1	22.3	23.1	24.1	25.4	26.4	27.1	28.1
29.3	30.4	31.2	32.3	33.4	34.3	35.2	36.1	37.3	38.4	39.2	40.3	41.1	42.3

PIPES AND CISTERNS

1. A pipe can fill a cistern in 25 hours. Find the part of tank filled in 5 hours.
- $\frac{1}{25}$
 - $\frac{1}{5}$
 - $\frac{1}{10}$
 - Data inadequate
 - None of these
2. A pipe can empty a cistern in 27 hours. Find the time in which $\frac{2}{3}$ part of the cistern will be emptied.
- 9 hours
 - 12 hours
 - 15 hours
 - 18 hours
 - None of these
3. A tap can fill a cistern in 8 hours and another can empty it in 16 hours. If both the taps are opened simultaneously, the time (in hours) to fill the tank is:
- 8
 - 10
 - 16
 - 24
 - None of these
4. A fill pipe can fill $\frac{3}{5}$ of cistern in 21 minutes. In how many minutes, it can fill $\frac{1}{7}$ of the cistern.
- 12 minutes
 - 18 minutes
 - 15 minutes
 - 17 minutes
 - None of these
5. A pipe can empty a tank in 15 hrs and another pipe can empty it in 10 hours. If both the pipes are opened simultaneously, find the time in which a full tank is emptied.
- 8 hrs
 - 6 hrs
 - 4 hrs
 - 5 hrs
 - None of these
6. Two pipes A and B can fill a tank in 30 minutes and 15 minutes respectively. If both the pipes are opened simultaneously, how much time will be taken to fill the tank?
- 10 minutes
 - 12 minutes
 - 8 minutes
 - 9 minutes
 - None of these
7. There is a leak in the bottom of a cistern. When the cistern is thoroughly repaired, it would be filled in 12 minutes. It now takes 18 minutes longer. If the cistern is full, how long would the leak take to empty the cistern?
- 20 minutes
 - 24 minutes
 - 26 minutes
 - 30 minutes
 - None of these
8. Tap A can fill a water tank in 25 minutes, tap B can fill the same tank in 40 minutes and tap C can empty the tank in 30 minutes. If all the three taps are opened together, in how many minutes will the tank be completely filled up or emptied?
- $3\frac{2}{13}$
 - $15\frac{5}{13}$
 - $8\frac{2}{13}$
 - $31\frac{11}{19}$
 - None of these
9. Two pipes A and B can fill a cistern in 24 minutes and 30 minutes respectively. There is also an outlet C. If all the three pipes are opened together, the tank is full in 20 minutes. How much time will be taken by C to empty the full tank?
- 30 min
 - 40 min
 - 45 min
 - 1 hour
 - None of these
10. In what time would a cistern be filled by three pipes whose diameters are 1 cm, 3 cm, 4 cm, running together, when the largest alone fill it in 26 minutes, the amount of water flowing in by each pipe being proportional to the square of its diameter?
- 20 minutes
 - 24 minutes
 - 16 minutes
 - 12 minutes
 - None of these
11. Two pipes A and B can fill a tank in 36 minutes and 48 minutes respectively. If both the pipes are opened simultaneously, after how much time should B be closed so that the tank is full in 27 minutes?
- 10 min
 - 12 min
 - 14 min
 - 16 min
 - None of these
12. Two pipes P and Q would fill a cistern in 12 and 16 minutes respectively. Both pipes being opened, find when the first pipe must be turned off so that the cistern may be just filled in 8 minutes.
- 15 minutes
 - 8 minutes
 - 6 minutes
 - 10 minutes
 - None of these
13. If two pipes function simultaneously, the reservoir is filled in 6 hrs. One pipe fills the reservoir 5 hours faster than the other. How many hours does the faster pipe take to fill the reservoir?
- 20 hours
 - 10 hours
 - 15 hours
 - 12 hours
 - None of these
14. Three pipes A, B and C can fill a cistern in 36 minutes. After working together for 12 minutes, C is closed and A and B fill the cistern in 48 minutes. Then find the time in which the cistern can be filled by pipe C.
- 72 minutes
 - 60 minutes
 - 48 minutes
 - 64 minutes
 - None of these
15. Three pipes A, B and C can fill a cistern in 18 minutes. After working together for 6 minutes, C is closed and A and B fill the cistern in 24 minutes. Then find the time in which the cistern can be filled by pipe C.
- 30 minutes
 - 24 minutes
 - 36 minutes
 - 45 minutes
 - None of these
16. Three pipes A, B and C are connected to a tank. A and B together can fill the tank in 60 minutes, B and C together in 40 minutes and C and A together in 30 minutes. In how much time will each pipe fill the tank separately?
- 80 min, 240 min, 48 min
 - 40 min, 120 min, 24 min
 - 60 min, 250 min, 64 min
 - 65 min, 240 min, 64 min
 - None of these

17. Three pipes A, B and C are connected to a tank. A and B together can fill the tank in 12 hrs, B and C together in 20 hrs and C and A together in 15 hrs. In how much time will each pipe fill the tank separately?
 (1) 10 hrs, 15 hrs, 30 hrs (2) 20 hrs, 15 hrs, 60 hrs (3) 20 hrs, 30 hrs, 60 hrs
 (4) 20 hrs, 30 hrs, 45 hrs (5) None of these
18. Two pipes can separately fill a tank in 10 hrs and 15 hrs respectively. Both the pipes are opened to fill the tank but when the tank is $\frac{1}{6}$ full a leak develops in the tank through which $\frac{1}{6}$ of the water supplied by both the pipes leak out. What is the total time taken to fill the tank?
 (1) 7 hrs (2) 5 hrs (3) 6 hrs (4) 9 hrs (5) None of these
19. Two pipes can separately fill a tank in 30 hrs and 45 hrs respectively. Both the pipes are opened to fill the tank but when the tank is $\frac{2}{3}$ full a leak develops in the tank through which $\frac{2}{3}$ of the water supplied by both the pipes leak out. What is the total time taken to fill the tank?
 (1) 25 hrs (2) 30 hrs (3) 35 hrs (4) 38 hrs (5) None of these
20. A cistern is normally filled in 4 hrs but takes 1 hr longer to fill because of a leak in its bottom. If the cistern is full, the leak will empty it in ___ hr.
 (1) 10 hrs (2) 20 hrs (3) 15 hrs (4) 12 hrs (5) None of these
21. If three taps are opened together, a tank is filled in 6 hrs. One of the taps can fill it in 5 hrs and another in $7\frac{1}{2}$ hrs. How does the third tap work?
 (1) 6 hours, fill pipe (2) 8 hours, waste pipe (3) 6 hours, waste pipe
 (4) 8 hours, fill pipe (5) None of these
22. Two pipes A and B can separately fill in $7\frac{1}{2}$ minutes and 5 minutes respectively and a waste pipe C can carry off 14 litres per minute. If all the pipes are opened when the cistern is full, it is emptied in 1 hour. How many litres does the cistern hold?
 (1) 40 litres (2) 30 litres (3) 35 litres (4) 45 litres (5) None of these
23. Two pipes A and B can separately fill in 30 and 20 minutes respectively and a waste pipe C can carry off 6 litres per minute. If all the pipes are opened when the cistern is full, it is emptied in 60 minutes. How many litres does the cistern hold?
 (1) 10 litres (2) 30 litres (3) 60 litres (4) 45 litres (5) None of these
24. There are 10 filling pipes each capable of filling a cistern alone in 6 minutes and 6 emptying pipes each capable of emptying a cistern alone in 8 minutes. All pipes are opened together and as a result, tank fills 22 litres of water per minute. Find the capacity of the tank.
 (1) 48 litres (2) 36 litres (3) 24 litres (4) 16 litres (5) None of these
25. There are 6 filling pipes each capable of filling a cistern alone in 16 minutes and 4 emptying pipes each capable of emptying a cistern alone in 20 minutes. All pipes are opened together and as a result, tank fills 14 litres of water per minute. Find the capacity of the tank.
 (1) 60 litres (2) 80 litres (3) 75 litres (4) 45 litres (5) None of these
26. There are 3 filling pipes each capable of filling a cistern alone in 8 minutes and 2 emptying pipes each capable of emptying a cistern alone in 10 minutes. All pipes are opened together and as a result, tank fills 7 litres of water per minute. Find the capacity of the tank.
 (1) 20 litres (2) 25 litres (3) 40 litres (4) 30 litres (5) None of these
27. There are 12 filling pipes each capable of filling a cistern alone in 32 minutes and 8 emptying pipes each capable of emptying a cistern alone in 40 minutes. All pipes are opened together and as a result, tank fills 28 litres of water per minute. Find the capacity of the tank.
 (1) 160 litres (2) 120 litres (3) 100 litres (4) 80 litres (5) None of these
28. Two pipes can fill a cistern in 10 and 15 hours respectively. The pipes are opened simultaneously and it is found that due to leakage in the bottom, 2 hrs extra are taken for the cistern to be filled up. If the cistern is full, in what time would the leak empty it?
 (1) 20 hrs (2) 21 hrs (3) 24 hrs (4) 28 hrs (5) None of these

29. Two pipes can fill a cistern in 30 and 15 hours respectively. The pipes are opened simultaneously and it is found that due to leakage in the bottom, 5 hrs extra are taken for the cistern to be filled up. If the cistern is full, in what time would the leak empty it?
- (1) 60 hrs (2) 45 hrs (3) 35 hrs (4) 30 hrs (5) None of these
30. A cistern has a leak which would empty it in 4 hours. A tap is turned on which admits 3 litres a minute into the cistern, and it is now emptied in 6 hours. How many litres does the cistern hold?
- (1) 360 litres (2) 1080 litres (3) 2160 litres (4) 2260 litres (5) None of these
31. A cistern has a leak which would empty it in 10 hours. A tap is turned on which admits 2 litres per hr into the cistern, and it is now emptied in 15 hours. How many litres does the cistern hold?
- (1) 50 litres (2) 60 litres (3) 45 litres (4) 360 litres (5) None of these
32. One filling pipe A is 5 times faster than second filling pipe B. If B can fill a cistern in 36 minutes, then find the time when the cistern will be full if both fill pipes are opened together.
- (1) 6 minutes (2) 8 minutes (3) 4 minutes (4) 12 minutes (5) None of these
33. One fill pipe A is 4 times faster than second fill pipe B and takes 15 minutes less than the fill pipe B. When will the cistern be full if both fill pipes are opened together?
- (1) 4 min (2) 6 min (3) 9 min (4) 12 min (5) None of these
34. 8 taps are fitted to a water tank. Some of them are water taps to fill the tank and the remaining are outlet taps used to empty the tank. Each water tap can fill the tank in 12 hours and each outlet tap can empty it in 36 hours. On opening all the taps, the tank is filled in 3 hours. Find the number of water taps.
- (1) 5 (2) 4 (3) 3 (4) 2 (5) None of these
35. 16 taps are fitted to a water tank. Some of them are water taps to fill the tank and the remaining are outlet taps used to empty the tank. Each water tap can fill the tank in 6 hours and each outlet tap can empty it in 18 hours. On opening all the taps, the tank is filled in $1\frac{1}{2}$ hours. Find the number of empty taps.
- (1) 7 (2) 9 (3) 6 (4) 8 (5) None of these
36. 9 taps are fitted to a water tank. Some of them are water taps to fill the tank and the remaining are outlet taps used to empty the tank. Each water tap can fill the tank in 9 hours and each outlet tap can empty it in 9 hours. On opening all the taps, the tank is filled in 9 hours. Find the number of water taps.
- (1) 4 (2) 5 (3) 6 (4) Can't be determined (5) None of these
37. One fill pipe A takes 4 minutes more to fill the cistern than two fill pipes A and B opened together to fill it. Second fill pipe B takes 9 minutes more to fill cistern than two fill pipes A and B opened together to fill it. When will the cistern be full if both pipes are opened simultaneously.
- (1) 4 minutes (2) 6 minutes (3) 5 minutes (4) 7 minutes (5) None of these
38. Two fill taps A and B can separately fill a cistern in 10 and 20 minutes respectively. They started to fill a cistern together but fill tap A is turned off after few minutes and fill tap B fills the rest part of cistern in 8 minutes. After how many minutes, was tap A turned off?
- (1) 3 min (2) 4 min (3) 5 min (4) 2 min (5) None of these
39. A bath can be filled by the cold water pipe in 10 minutes and by the hot water pipe in 15 minutes. A person leaves the bathroom after turning on both pipes simultaneously and returns at the moment when the bath should be full. Finding, however, that the waste pipe has been open, he now closes it. In 4 minutes more the bath is full. In what time would the waste pipe empty it?
- (1) 9 min (2) 8 min (3) 12 min (4) 6 min (5) None of these
40. A, B, C are pipes attached to a cistern. A and B can fill it in 20 and 30 minutes respectively, while C can empty it in 15 minutes. If A, B, C be kept open successively for 1 minute each, how soon will the cistern be filled?
- (1) 167 min (2) 160 min (3) 166 min (4) 164 min (5) None of these

ANSWER

PIPES AND CISTERNS

1.2	2.4	3.3	4.3	5.2	6.1	7.1	8.4	9.2	10.3	11.2	12.3	13.2	14.1
15.3	16.1	17.3	18.1	19.2	20.2	21.3	22.1	23.3	24.3	25.2	26.3	27.1	28.3
29.4	30.3	31.2	32.1	33.1	34.1	35.2	36.2	37.2	38.2	39.1	40.1		

WORK AND WAGES

1. Ram can do a certain work in 15 days while Chandan can do it in 25 days. Both work together and finish the work. In what ratio should the total earnings be divided between them?
 (1) 3:5 (2) 2:5 (3) 5:2 (4) 5:3 (5) None of these
2. A, B and C can do a work in 4, 6 and 10 days respectively. They finish the work together and earn ₹ 310. What is the share of each?
 (1) ₹ 150, ₹ 100, ₹ 60 (2) ₹ 140, ₹ 110, ₹ 60 (3) ₹ 160, ₹ 90, ₹ 60
 (4) ₹ 150, ₹ 110, ₹ 50 (5) None of these
3. A, B and C contract to do a work for ₹ 4200. A can do the work in 6 days, B in 10 days and C in 12 days. If they work together to do the work, what is the share of C?
 (1) ₹ 2000 (2) ₹ 1200 (3) ₹ 1000 (4) ₹ 1500 (5) None of these
4. A, B and C contract to do a work for ₹ 6500. A can do the work in 10 days, B in 15 days and C in 20 days. If they work together to do the work, what is the share of B?
 (1) ₹ 2000 (2) ₹ 3000 (3) ₹ 1500 (4) ₹ 2500 (5) None of these
5. Ram can do a work in 20 days. Ram and Shyam together do the same work in 15 days. If they are paid ₹ 400 for that work, what is the share of each.
 (1) ₹ 300, ₹ 100 (2) ₹ 200, ₹ 200 (3) ₹ 250, ₹ 150 (4) ₹ 350, ₹ 50 (5) None of these
6. Suresh can do a work in 15 days. Suresh and Ramesh together do the same work in 10 days. If they are paid ₹ 1500 for the work, how should the money be divided between them?
 (1) ₹ 1000, ₹ 500 (2) ₹ 700, ₹ 800 (3) ₹ 1200, ₹ 300
 (4) ₹ 1300, ₹ 400 (5) None of these
7. A and B contract to do a work together for ₹ 300. A alone can do it in 8 days and B alone in 12 days. But with the help of C they finish it in 4 days. Find the share of C.
 (1) ₹ 30 (2) ₹ 60 (3) ₹ 100 (4) ₹ 50 (5) None of these
8. A, B and C undertake to do a work for ₹ 660. A and B together do $\frac{8}{11}$ of the work and rest is done by C alone. How much should C get?
 (1) ₹ 200 (2) ₹ 180 (3) ₹ 180 (4) ₹ 190 (5) None of these
9. A, B and C undertake to do a work for ₹ 707. A and B together do $\frac{5}{7}$ of the work and rest is done by C alone. How much should C get?
 (1) ₹ 202 (2) ₹ 200 (3) ₹ 102 (4) ₹ 150 (5) None of these
10. A, B and C undertake to do a work for ₹ 480. A and B together do $\frac{1}{4}$ of the work and rest is done by C alone. How much should C get?
 (1) ₹ 360 (2) ₹ 120 (3) ₹ 240 (4) ₹ 180 (5) None of these
11. If the wages of 45 women amount to ₹ 46575 in 48 days, how many men must work 16 days to receive ₹ 17250, the daily wages of a man being double than those of a woman?
 (1) 20 men (2) 25 men (3) 30 men (4) 15 men (5) None of these
12. Wages of 20 boys for 15 days is ₹ 9000. If the daily wage of a man is one and half times that of a boy, how many men must work for 30 days to earn ₹ 13500?
 (1) 12 men (2) 20 men (3) 16 men (4) 10 men (5) None of these

13. Wages of 10 women for 5 days is ₹ 1250. The daily wage of a man is twice that of a woman. How many men must work for 8 days to earn ₹ 1600?
- (1) 5 men (2) 8 men (3) 4 men (4) 6 men (5) None of these
14. If 5 men with 7 boys can earn ₹ 3825 in 6 days and 2 men with 3 boys can earn ₹ 1050 in 4 days, in what time will 7 men with 6 boys earn ₹ 22500?
- (1) 15 days (2) 20 days (3) 25 days (4) 30 days (5) None of these
15. If 3 men with 4 boys can earn ₹ 2100 in 7 days and 11 men with 13 boys can earn ₹ 8300 in 8 days, in what time will 7 men with 9 boys earn ₹ 11000?
- (1) 16 days (2) 18 days (3) 14 days (4) 20 days (5) None of these
16. If 12 men with 13 boys can earn ₹ 4893.75 in 3 days and 5 men with 6 boys can earn ₹ 3462.50 in 5 days, in what time will 3 men with 4 boys earn ₹ 4500?
- (1) 8 days (2) 7 days (3) 10 days (4) 9 days (5) None of these
17. 5 men and 5 women earn ₹ 660 in 3 days. 10 men and 20 women earn ₹ 3500 in 5 days. In how many days can 6 men and 4 women earn ₹ 1060?
- (1) 5 days (2) 10 days (3) 6 days (4) 12 days (5) None of these
18. 4 men and 6 boys earn ₹ 1600 in 5 days. 3 men and 7 boys earn ₹ 1740 in 4 days, in what time will 7 men and 6 boys earn ₹ 3760?
- (1) 6 days (2) 8 days (3) 10 days (4) 11 days (5) None of these
19. A, B and C together earn ₹ 2700 in 18 days. A and C together earn ₹ 940 in 10 days. B and C together earn ₹ 1520 in 20 days. Find the daily earning of C.
- (1) ₹ 20 (2) ₹ 40 (3) ₹ 10 (4) ₹ 15 (5) None of these
20. A, B and C together earn ₹ 640 in 8 days. A and C together earn ₹ 250 in 5 days. B and C together earn ₹ 420 in 6 days. Find the daily earning of C.
- (1) ₹ 60 (2) ₹ 50 (3) ₹ 80 (4) ₹ 40 (5) None of these
21. A, B and C together earn ₹ 1500 in 10 days. A and C together earn ₹ 800 in 8 days. B and C together earn ₹ 900 in 9 days. Find the daily earning of B.
- (1) ₹ 50 (2) ₹ 60 (3) ₹ 40 (4) ₹ 30 (5) None of these

ANSWER

WORK AND WAGES

1.4	2.1	3.3	4.1	5.1	6.1	7.4	8.3	9.1	10.1	11.2	12.4	13.3	14.4
15.1	16.3	17.1	18.2	19.1	20.4	21.1							

TRAIN

1. A train 110 m in length runs through a station at the rate of 36 km per hour. How long will it take to pass a given point?
 (1) 11 sec (2) 12 sec (3) 13 sec (4) 15 sec (5) None of these
2. A train 540 m long is running with a speed of 72 km/hr. In what time will it pass a tunnel 160 m long?
 (1) 40 sec (2) 30 sec (3) 35 sec (4) 42 sec (5) None of these
3. A train 200 m long is running with a speed of 72 km/hr. In what time will it pass a platform 160 m long?
 (1) 18 sec (2) 21 sec (3) 15 sec (4) 20 sec (5) None of these
4. Two trains 70 m and 80 m long respectively, run at the rates of 68 and 40 km an hour respectively on parallel rails in opposite directions. How long do they take to pass each other?
 (1) 5 seconds (2) 10 seconds (3) 12 seconds (4) 6 seconds (5) None of these
5. A train 110 metres long travels at 60 km/hr. How long does it take to cross another train, 70 metres long, running at 54 km/hr in the same direction?
 (1) 2 min 40 sec (2) 2 min 48 sec (3) 3 min 48 sec (4) 3 min 40 sec (5) None of these
6. Two trains travel in the same direction at 56 km and 29 km an hour and the faster train passes a man in the slower train in 16 seconds. Find the length of the faster train.
 (1) 100 m (2) 120 m (3) 124 m (4) Data inadequate (5) None of these
7. A train running at 24 km/hr takes 30 seconds to pass a platform. Next, it takes 10 seconds to pass a man walking at 12 km/hr in the opposite direction. Find the length of the train.
 (1) 50 m (2) 100 m (3) 75 m (4) 120 m (5) None of these
8. Two trains are moving in the opposite direction at 30 km/hr and 24 km/hr. The faster train crosses a man in the slower train in 6 seconds. Find the length of the faster train.
 (1) 80 m (2) 100 m (3) 110 m (4) 90 m (5) None of these
9. A train running at 35 km per hour takes 18 seconds to pass a platform. Next, it takes 12 seconds to pass a man walking at the rate of 5 km/hr in the same direction. Find the length of the train and that of the platform.
 (1) 50 m, 75 m (2) 100 m, 75 m (3) 75 m, 75 m (4) 85 m, 55 m (5) None of these
10. A train running at 25 km/hr takes 18 seconds to pass a platform. Next it takes 10 seconds to pass a man walking at the rate of 7 km/hr in the same direction. Find the length of the platform and the length of the train.
 (1) 25 m, 50 m (2) 45 m, 85 m (3) 75 m, 50 m (4) 50 m, 80 m (5) None of these
11. 250 metres long train crosses a platform of length 350 metres in 50 seconds. Find the time for train to cross a bridge of 230 metres.
 (1) 45 sec (2) 50 sec (3) 40 sec (4) 54 sec (5) None of these
12. 60 metres long train crosses a tunnel of length 40 metres in 10 seconds. Find the time for train to cross a man standing on a platform of length 65 metres.
 (1) 6 sec (2) 8 sec (3) 5 sec (4) 4 sec (5) None of these
13. Two trains start at the same time from Patna and Gaya and proceed towards each other at the rate of 60 km and 40 km per hour respectively. When they meet, it is found that one train has travelled 20 km more than the other. Find the distance between Gaya and Patna.
 (1) 100 km (2) 80 km (3) 120 km (4) 90 km (5) None of these
14. Two stations A and B are 110 kms apart on a straight line. One train starts from A at 7 AM and travels towards B at 10 km/hr speed. Another train starts from B at 8 AM and travels towards A at 25 km/hr speed. At what time will they meet?
 (1) 9 AM (2) 10 AM (3) 11 AM (4) 11.5 AM (5) None of these
15. Two stations A and B are 60 km apart on a straight line. A train starts from A towards B at the rate of 20 km/hr. 3 hours later another train starts from B and travels towards A at the rate of 25 km/hr. When will the first train meet to the second train?
 (1) 1 hr (2) 2 hrs (3) 3 hrs (4) 4 hrs (5) None of these
16. A train travelling at a uniform speed, clears a platform 200 metres long in 10 seconds and passes a telegraph post in 6 seconds. Find the length of the train and its speed.
 (1) 300 m, 180 km/hr (2) 200 m, 180 km/hr (3) 300 m, 50 km/hr
 (4) 200 m, 50 km/hr (5) None of these
17. Two stations A and B are 95 km apart on a straight line. A train starts from A and travels towards B at 35 km/hr. Another train, starting from B 30 minutes earlier, travels towards A at 40 km/hr. When will the first train meet to the second train?
 (1) 2 hrs (2) 1 hr (3) 1.5 hrs (4) 2.5 hrs (5) None of these

18. Two trains of the same length but with different speeds pass a static pole in 5 seconds and 6 seconds respectively. In what time will they cross each other when they are moving in the same direction.
 (1) 1 hr (2) 50 sec (3) 1 min (4) 60 min (5) None of these
19. Two trains of the same length but with different speeds pass a static pole in 6 seconds and 9 seconds respectively. In what time will they cross each other when they are moving in the same direction.
 (1) 36 sec (2) 30 sec (3) 40 sec (4) 42 sec (5) None of these
20. Two trains of the same length but with different speeds pass a static pole in 4 seconds and 8 seconds respectively. In what time will they cross each other when they are moving in the opposite direction.
 (1) $5\frac{1}{3}$ sec (2) 5 sec (3) 6 sec (4) 5.3 sec (5) None of these
21. Two trains of the same length but with different speeds pass a static pole in 10 seconds and 15 seconds respectively. In what time will they cross each other when they are moving in the opposite direction.
 (1) 13 sec (2) 11 sec (3) 12.5 sec (4) 12 sec (5) None of these
22. Two trains of the length 200 m and 250 m respectively with different speeds pass a static pole in 8 seconds and 14 seconds respectively. In what time will they cross each other when they are moving in the same direction?
 (1) 63 sec (2) 64 sec (3) 72 sec (4) 81 sec (5) None of these
23. Two trains of the length 100 m and 150 m respectively with different speeds pass a static pole in 1 min and 3 min respectively. In what time will they cross each other when they are moving in the opposite direction?
 (1) $\frac{5}{3}$ sec (2) 100 sec (3) 120 sec (4) 150 sec (5) None of these
24. Two trains of the length 200 m and 100 m respectively, pass a static pole in 6 seconds and 5 seconds respectively. In what time will they cross each other when they are moving in opposite direction.
 (1) 4.5 sec (2) 5.625 sec (3) 6 sec (4) 6.5 sec (5) None of these
25. Two trains, 130 and 110 metres long, while going in the same direction, the faster train takes one minute to pass the other completely. If they are moving in opposite direction, they pass each other completely in 3 seconds. Find the speed of trains.
 (1) 24 m/sec, 19 m/sec (2) 42 m/sec, 38 m/sec (3) 40 m/sec, 36 m/sec
 (4) Data inadequate (5) None of these
26. Two trains running at the rates of 45 and 36 km an hour respectively, on parallel rails in opposite directions, are observed to pass each other in 8 seconds, and when they are running in the same direction at the same rate as before, a person sitting in the faster train observes that he passes the other in 30 seconds. Find the length of the trains.
 (1) 105 m, 75 m (2) 50 m, 25 m (3) 120 m, 90 m (4) 100 m, 75 m (5) None of these
27. A train 75 metres long overtook a man who was walking at the rate of 6 km/hr and passed him in 18 seconds. Again, the train overtook a second person in 15 seconds. At what rate was the second person travelling?
 (1) 3 km/hr (2) 5 km/hr (3) 8 km/hr (4) 9 km/hr (5) None of these
28. A train passes two men walking in the direction opposite to the train at 7 m/sec and at 12 m/sec in 5 and 4 seconds respectively. Find the length of the train.
 (1) 100 m (2) 120 m (3) 75 m (4) 125 m (5) None of these
29. A train 120 m in length passes a pole in 12 seconds and another train of the length 100 m travelling in opposite direction in 10 seconds. Find the speed of the second train in km per hour.
 (1) 43.2 km/hr (2) 43 km/hr (3) 44 km/hr (4) 43.5 km/hr (5) None of these
30. A train crosses a 420 metres and 244 metres long bridge in 50 seconds and 34 seconds respectively. Find the length and speed of the train.
 (1) 13 m, 4 m/sec (2) 130 m, 22 m/sec (3) 130 m, 11 m/sec
 (4) 6 m, 11 m/sec (5) None of these

ANSWER

TRAIN													
1.1	2.3	3.1	4.1	5.2	6.2	7.2	8.4	9.2	10.3	11.3	12.1	13.1	14.2
15.3	16.1	17.2	18.3	19.1	20.1	21.4	22.1	23.2	24.2	25.2	26.1	27.1	28.1
29.1	30.3												