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| **PROBLEMS ON NUMBERS** |

1. **Three-fourth of a number exceeds its one-third by 60. The number is:**
2. **108 (b) 144 (c) 184 (d) 224**

**Let the number be x. Then (3/4) x – (1/3) x = 60.**

**LCM of 4 and 3 is 12. Then, it becomes 9x – 4x = 60 x 12**

**5x = 720. This implies x = (720/5) = 144**

1. **A number whose fifth part increased by 4 is equal to its fourth part reduced by 10, is:**
2. **240 (b) 260 (c) 280 (d) 300**

**Let the number be x. Then (x/5) + 4 = (x/4) – 10. This implies (x/4) – (x/5) = 4 + 10.**

**LCM of 4 and 5 is 20. Then it becomes 5x – 4x = 14 x 20. Therefore x = 280**

1. **Of the three numbers, the sum of the first two is 45; the sum of the second and the third is 55 and the sum of the third and thrice the first is 90. The third number is:**
2. **20 (b) 25 (c) 30 (d) 35**

**Let the numbers be x, y and z. Then x + y = 45, y + z = 55 and z + 3x = 90.**

**By adding all, we get 4x + 2y + 2z = 90 + 55 + 45 or 2(2x + y + z) = 190**

**or 2x + y + z = (190/2) = 95 or 2x + 55 = 95 or 2x = 40 or x = 20.**

**By introducing x value in z + 3x = 90 we get z + 3(20) = 90 or z = 30**

1. **The sum of two numbers is twice their difference. If one of the numbers is 10, the other one is:**
2. **30 or (10/3) (b) 30 or –(10/3) (c) 30 (d) (10/3)**

**Let the numbers be x and y. Then x + y = 2(x – y) or x + y = 2x – 2y or x = 3y.**

**Here we consider two cases: If y = 10, x becomes 30 (or) if x = 10, y becomes (10/3).**

**Therefore the answer is 30 or (10/3)**

1. **Which of the following can be a product of two 3-digit numbers \* \* 3 and \* \* 8?**
2. **1010024 (b) 991014 (c) 9124 (d) None**

**When two 3-digit numbers are multiplied, the product carries a 5-digit number or 6- digit number.**

**Ex: (103 x 108) = 11124 (minimum value and 5 –digit number)**

**(993 x 998) = 991014 (maximum value and 6 –digit number)**

1. **A bag contains 20 gumballs. If there are 8 red, 7 white and 5 green, what is the minimum number of gumballs one must pick from the bag to be assured of one of each colour?**
2. **3 (b) 8 (c) 9 (d) 16**
3. **Gasoline varies in cost from $1.92 to $2.24 per gallon. If a car’s mileage varies from 16 to 24 miles per gallon, what is the difference between the most and the least that the gasoline for a 480-mile trip will cost?**
4. **$10.24 (b) $14.08 (c) 23.04 (d) $28.80**

**Maximum Cost = (Trip /Less mileage) x High price = (480/16) x 2.24 = 30 x 2.24 = $67.20**

**Minimum Cost = (Trip/More mileage) x Low price = (480/24) x 1.92 = 20 x 1.92 = $38.4**

**Difference = 67.20 – 38.40 = $28.80**

1. **The sum of three numbers is 68. If the ratio between first and second be 2 : 3 and that between second and third be 5 : 3, then the second number is:**
2. **20 (b) 30 (c) 48 (d) 58**

**First ratio = 2 : 3 = 10 : 15 Second ratio = 5 : 3 = 15 : 9**

**Ratio = 10 : 15 : 9**

**Total parts must be equal to total given value. That means 34 parts = 68**

**Second number = 15 parts = (15 x 68)/34 = 30**

1. **How many figures (digits) are required to number a book containing 200 pages?**
2. **200 (b) 372 (c) 492 (d) 600**

**Figures (digits) required = 1 (9) + 2 (90) + 3 (101) = 9 + 180 + 303 = 492**

1. **How many key strokes (pressings) are required to type numbers from 1 to 1000? (Company Question)**

1. **A number ‘a’ when divided by 75 leaves a remainder 30. What will be the remainder if ‘5a’ is divided by 75?**
2. **45 (b) 30 (c) 15 (d) 0**

**Minimum number for value ‘a’ = 75 + 30 = 105 5a = 5(105) = 525**

**When 525 divided by 75, remainder is zero.**

1. **In operation a\* = 2a – 1 and a\*\* = 2a + 1, then what is (9\*)\*\*?**
2. **33 (b) 35 (c) 37 (d) 39**

**9\* = 2 (9 – 1) = 17**

**17\*\* = 17 (2) + 1 = 35**

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| **COMPANY QUESTIONS** |

1. **In a group of 25 girls, it was found that everyone liked at least one of the two brands of cola – Mr. Cola, Dr. Cola. 20 girls liked Dr. Cola, and 20 liked Mr. Cola. How many liked both the colas?**
2. **5 (b) 10 (c) 15 (d) 20**

**No. of people who liked both the colas = 20 + 20 – 25 = 15**

1. **In a hotel, 60% had vegetarian lunch while 30% had non-vegetarian lunch and 15% had both types of lunch. If 96 people were present, how many did not eat either lunch?**
2. **20 (b) 24 (c) 25 (d) 76**

**Out of 100 people, persons who take veg only = 60 – 15 = 45**

**Persons who take non-veg only = 30 – 15 = 15**

**Persons who take both veg & non-veg = 15**

**Persons who did not either lunch = 100 – 45 – 15 – 15 = 25**

**For 96 people given, who did not eat either lunch = 96(25/100) = 24**

1. **An iron water-tank with a capacity of 10,000 gallons has a water-supply inlet, which feeds water at the rate of 300 gallons per hour. This water inlet starts automatically when the water level goes below the 5000-gallon mark. There is a hole formed at the bottom of the tank due to rusting. When the water-tank is full, how long will take for the whole tank to be emptied if the water goes out of the hole at the rate of 500-gallons per hour? Assume that there is no other loss/usage of water?**
2. **10 hours (b) 20 hours (c) 25 hours (d) 35 hours**

**Company Question**

1. **A lake has a rare breed of lotuses that triple in number every minute. If one-third of the lake is full of flowers in 30 minutes, what is the total time taken for the whole lake to be full?**
2. **1 min (b) 31 min (c) 60 min (d) 90 min**
3. **A boy was asked to multiply a certain number by 27. He multiplied it by 72 and got an answer which was 270 more than the correct answer. Find the number?**
4. **5 (b) 6 (c) 9 (d) 18**

**72x – 27x = 270 implies 45x = 270 x = 6**

1. **In an examination, a student was asked to find (3/14) of a certain number. By mistake, he found (3/4) of it. His answer was 150 more than the correct answer. The given number is:**
2. **290 (b) 280 (c) 240 (d) 180**

**(3/4) x – (3/14) x = 150 LCM = 28**

**21x – 6x = (150)(28) implies 15x = (150)(28) x = 280**

1. **The sum of the first 63 terms of the series: 5 – 3 + 2 – 5 + 3 - 2 + 5 – 3 + 2 – 5 ……… is**
2. **5 (b) 4 (c) 3 (d) 2**
3. **A shopkeeper knows that the price of a cigarette packet will increase by Rs3 in the next budget. He bought some packets of cigarette for Rs2700. If he bought the cigarette packets on new price, he would get 10 packets less. What is the number of packets bought by him?**
4. **80 (b) 90 (c) 100 (d) 120**
5. **A sequence of numbers is such that multiplying the previous term by 2 and adding 1 obtains each term, except the first term. If the fourth term in the series is 31, what is the first term?**
6. **63 (b) 15 (c) 7 (d) 3**
7. **Maria plans to make sandwiches for a picnic. She has three types of bread from which to choose (rye, sourdough and white), four types of meat from which to choose (salami, bologna, ham and pastrami), and three types of cheese from which to choose (Swiss, cheddar and jack). If Maria will use only one type of bread, one type of meat and one type of cheese on each sandwich, how many different kinds of sandwiches can Maria make?**
8. **3 (b) 4 (c) 10 (d) 36**
9. **The sum of all the possible factors of 500 (including 1 and 500 itself) equals:**
10. **784 (b) 980 (c) 1092 (d) 1350**

**Sum of possible factors are 500 = 1 + 2 + 4 + 5 + 10 + 20 + 25 + 50 + 100 + 125 + 250 + 500 = 1092**

1. **A boy multiplies 987 by a certain number and obtains 559981 as his answer. If in the answer, both 9’s are wrong but the other digits are correct, then the correct answer will be:**
2. **553681 (b) 555181 (c) 555681 (d) 556581**
3. **Four children A, B, C and D divide a bag of sweets. A takes (1/3) of them, B (2/5)th of the remainder and the rest is equally shared between C and D. What fraction of the sweets did C or D get?**
4. **(1/4) (b) (1/5) (c) (1/6) (d) (1/17)**

**A’s share = (1/3)(15x) = 5x Remaining = 15x – 5x = 10x**

**B’s share = (2/5)(10x) = 4x Remaining = 10x – 4x = 6x**

**C or D will get 3x shares each. Fractional part = (3x/15x) = (1/5)**

1. **A train starts full of passengers. At the first station, it drops one-third of passengers and takes 280 more. At the second station, it drops one-half of the new total and takes 12 more. On arriving at the third station, it is found to have 248 passengers. The number of passengers in the beginning was:**
2. **156 (b) 288 (c) 564 (d) 608**

**After leaving first station the train has (4x + 280)**

**After leaving second station the train has (2x + 140 + 12) = 2x + 152**

**Therefore 2x + 152 = 248 …………… x = 48**

**Total passengers at the starting point = 48 x 6 = 288**

1. **A man is employed for 30 days on the condition that he receives Rs1000 for each day he works and loses Rs250 for each day he is absent. He gets Rs20,000 in all. For how many days was he absent?**
2. **4 (b) 6 (c) 8 (d) 10**

**Let the no. of days absent is x**

**1000 (30 – x) – 250 (x) = 20000 30000 – 1000 x – 250 x = 20000**

**10000 = 1250x x = (10000/1250) = 8 days absent**

**Company Questions**

1. **The cost of 2 mangoes is equal to the cost of 10 oranges. If the total cost of 4 mangoes and 20 oranges is Rs80, then find the cost of one mango?**
2. **Rs10 (b) Rs15 (c) Rs20 (d) Rs25**
3. **If (a – b) is 6 more than (c + d) and (a + b) is 3 less than (c – d), then (a – c) is:**
4. **0.5 (b) 1 (c) 1.5 (d) 2**

**PRACTICE EXERCISE**

1. **The unit’s digit in the product (274 x 318 x 577 x 313) is:**
2. **2 (b) 3 (c) 4 (d) 5**
3. **If the unit digit in the product (459 x 46 x 28\* x 484) is 2, the digit in place of \* is:**
4. **3 (b) 4 (c) 5 (d) 7**
5. **When ‘n’ is divided by 4, the remainder is 3. What is the remainder when ‘2n’ is divided by 4?**
6. **0 (b) 1 (c) 2 (d) 3**
7. **The price of 4 pens and 3 pencils is Rs23, the price of 3 pencils and 5 erasers is Rs13, and the price of 7 erasers and 4 pens is Rs34, find the cost of 1 eraser?**
8. **Rs5 (b) Rs2.50 (c) Rs2 (d) Re1**
9. **A certain geometry class has 36 students. If two-thirds of the students are boys and three-fourths of the boys are under six feet tall, how many boys in the class are under six feet tall?**
10. **6 (b) 12 (c) 18 (d) 24**
11. **A license number is of the type $nn, where $ is any one letter from A to Z and n is any one digit from 0 to 9. How many different license numbers can there be?**
12. **2600 (b) 2800 (c) 3600 (d) 4800**
13. **If (x + y) : (x – y) = 7 : 3, then (x2 + y2) : (x2 – y2) is equal to:**
14. **49 : 9 (b) 29 : 21 (c) 16 : 29 (d) 25 : 4**
15. **You are given two functions, which are defined as: f(x) = x2 + x + 1 and g(x) = f(x)/2**

**What is the value of g(10)?**

1. **21.5 (b) 51.5 (c) 55.5 (d) 111**
2. **750 times 45 equals P. Therefore, 750 times 44 equals**
3. **P – 45 (b) P – 750 (c) P – 1 (d) 44P**
4. **A man spent (3/5) of his savings and was still left with Rs20000. What was his initial saving?**
5. **Rs50000 (b) Rs55000 (c) Rs60000 (d) Rs72000**
6. **When Jack travelled 25 km, he found that (3/5) of his journey was still left. What is the total journey to be covered by Jack?**
7. **60 km (b) 62.5 km (c) 65 km (d) 67.5 km**
8. **A person went to a stationery shop and purchased a pen for Rs15. If he is still left with (2/5) of his total money, find the total amount of money he had initially?**
9. **Rs25 (b) Rs30 (c) Rs35 (d) Rs40**
10. **Ratio of the sum and the difference of the two numbers is 13 : 3. Find the ratio of those two numbers?**
11. **5 : 8 (b) 8 : 3 (c) 8 : 5 (d) 8 : 7**
12. **From 50 to 90, find the number of odd and even numbers?**
13. **20, 21 (b) 20, 20 (c) 21, 22 (d) 19, 20**
14. **If 0.7 times one number is equal to 0.075 times another number, then the ratio of the numbers is:**
15. **2 : 25 (b) 3 : 28 (c) 9 : 7 (d) 28 : 25**
16. **The sum of two numbers is (28/25) of the first number. The second number is ………………… of the first.**
17. **12% (b) 14% (c) 15% (d) 16%**
18. **In a school, (4/5) of the children are boys. If the number of girls is 200, find the number of boys?**
19. **600 (b) 750 (c) 800 (d) 1000**
20. **If 2s = 9, then the value of s2 + (s – 1)2 + (s– 3)2 + (s – 5)2 is**
21. **45 (b) 35 (c) 25 (d) 9**
22. **If a \* b = 2a – 3b + ab, then 3 \* 5 + 5 \* 3 is equal to:**
23. **22 (b) 24 (c) 26 (d) 28**
24. **A number of friends decided to go on a picnic and planned to spend Rs960 on eatables. Four of them, however, did not turn up. As a consequence, the remaining ones had to contribute Rs40 each extra. The number of those who attended the picnic was:**
25. **24 (b) 16 (c) 12 (d) 8**

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| **AVERAGE** |

**Formula:**

**Average = (Sum of observations) / Number of observations)**

**A = (S/N) or S = AN**

1. **A batsman scores 35, 45 and 37 runs in first, second and third innings respectively. Find the average runs in the three innings?**

**Average runs = (35 + 45 + 37 / 3) = 39 runs**

1. **Find the average of first five multiples of 3?**

**Average = (3 + 6 + 9 + 12 + 15) / 5 = (45/5) = 9**

1. **The average marks obtained by 120 candidates in a certain examination is 35. Find the total marks?**

**Total marks = 120 x 35 = 4200**

1. **The average height of 30 boys out of a class of 50, is 160 cm. If the average height of the remaining boys is 165 cm, the average height of the whole class (in cm) is:**
2. **161 (b) 162 (c) 163 (d) 164**

**Required average = (30 x 160 + 20 x 165) / 50 = (4800 + 3300) / 50 = (8100/50) = 162**

1. **The average of three numbers is 20. If two numbers are 16 and 22, the third is:**
2. **22 (b) 20 (c) 19 (d) 18**

**Total of three numbers = (20 x 3) = 60**

**Third number = 60 – (16 + 22) = 22**

1. **The average of two numbers is M. If one number is N, then the other number is:**
2. **2N (b) 2M (c) M – N (d) 2M - N**

**Sum of two numbers = 2M. Therefore, other number = (2M – N)**

1. **The average of five results is 46 and that of the first four is 45. The fifth result is:**
2. **1 (b) 10 (c) 12.5 (d) 50**

**Fifth result = (46 x 5 – 45 x 4) = 230 – 180 = 50**

1. **The average of Kanchan’s marks in 7 subjects is 75. His average in six subjects excluding Science is 72. How many marks did he get in Science?**
2. **72 (b) 80 (c) 90 (d) 93**

**Marks in Science = (7 x 75) – (6 x 72) = 93**

1. **The average of eight numbers is 14. The average of six of these numbers is 16. The average of the remaining two numbers is:**
2. **4 (b) 8 (c) 12 (d) 16**

**Total of remaining two numbers= (8 x 14) – (6 x 16) = 16.**

**Therefore, average of remaining two numbers = 16/2 = 8.**

1. **The average price of three items of furniture is Rs15000. If their prices are in the ratio**

**3 : 5 : 7, the price of the cheapest item is:**

1. **Rs9000 (b) Rs15000 (c) Rs18000 (d) Rs21000**

**Let their prices be 3x, 5x and 7x. Then, 3x + 5x + 7x = 15000 x 3 (or) x = 3000**

**Therefore, cost of cheapest item = 3x = 3 x 3000 = Rs9000**

1. **A man spends Rs18,000 monthly on an average for the first four months and Rs20,000 monthly for the next 8 months and saves Rs56000 a year. His average monthly income is:**
2. **Rs20000 (b) Rs22000 (c) Rs24000 (d) Rs26000**

**Total annual income = Rs (18000 x 4 + 20000 x 8) + 56000 = Rs2,88,000**

**Therefore, average monthly income = (288000 / 12) = Rs24000**

1. **The average age of 30 students of a class is 12 years. The average age of a group of 5 of the students is 10 years and that of another group of 5 of them is 14 years. What is the average age of the remaining students?**
2. **8 years (b) 10 years (c) 12 years (d) 14 years**

**Total age of 20 students = Total age of 30 students – total age of 10 students**

**= (30 x 12) – (5 x 10 + 5 x 14) = 360 – 120 = 240**

**Average of remaining 20 students = (240 / 20) = 12 years**

1. **The average of 50 numbers is 38. If two numbers namely, 45 and 55 are discarded, the average of remaining numbers is:**
2. **36.50 (b) 37.00 (c) 37.50 (d) 37.52**

**Total of 50 numbers = 50 x 38 = 1900.**

**Discarded total = 45 + 55 = 100**

**Average of remaining 48 numbers = (1900 – 100) / 48 = 1800 / 48 = 37.50**

1. **The mean (average) of 100 observations was calculated as 40. It was found later on that one of the observations was misread as 83 instead of 53. The correct mean is:**
2. **39 (b) 39.7 (c) 40.3 (d) 42.7**

**Total = 40 x 100 = 4000**

**Difference in total = 83 – 53 = 30**

**Correct sum = 4000 – 30 = 3970**

**Correct mean (average) = 3970 / 100 = 39.7**

1. **The average of six numbers is 30. If the average of first four is 25 and that of last three is 35, the fourth number is:**
2. **25 (b) 30 (c) 35 (d) 40**

**Sum of 7 numbers = (4 x 25) + (3 x 35) = 205**

**Sum of 6 numbers = 6 x 30 = 180**

**Remaining number = 205 – 180 = 25**

1. **The average of 11 observations is 60. If the average of first five observations is 58 and that of the last five is 56, then the sixth observation is:**
2. **85 (b) 90 (c) 100 (d) 110**

**Sum of 11 observations = 11 x 60 = 660**

**Sum of 10 observations = (5 x 58) + (5 X 56) = 290 + 280 = 570**

**Therefore, sixth observation = 660 – 570 = 90**

1. **In seven given numbers, the average of first four numbers is 4 and that of the last four is also 4. If the average of these seven numbers is 3, the fourth number is:**
2. **3 (b) 4 (c) 7 (d) 11**

**Sum of 8 numbers = (4 x 4) + (4 x 4) = = 32**

**Sum of 7 numbers = (7 x 3) = 21**

**Therefore, fourth number = 32 – 21 = 11**

1. **The average of 25 results is 18. The average of first twelve of them is 14 and that of last twelve is 17. The thirteenth result is:**
2. **28 (b) 72 (c) 78 (d) 85**

**Sum of 25 results = 25 x 18 = 450**

**Sum of 24 results = (12 x 14) + (12 x 17) = 168 + 204 = 372**

**Therefore, the remaining number = 450 – 372 = 78**

1. **Out of four numbers, the average of first three is 16 and that of the last three is 15. If the last number is 18, the first number is:**
2. **20 (b) 21 (c) 23 (d) 25**

**Let the four numbers be a, b, c and d. Implies**

**a + b + c = 16 x 3 = 48**

**b + c + d = 15 x 3 = 45**

**d = 18 (given) then it becomes a + b + c + d = 48 + 18 = 66**

**a = (a + b + c + d) – (b +c + d) = 66 – 45 = 21**

1. **A motorist travels to a place at a speed of 50 km per hour and returns at 30 km per hour. Find his average speed for the whole journey in km per hour is:**
2. **35 (b) 37.5 (c) 40 (d) 50**

**Average speed = 2xy /(x + y) km/hr = (2 x 50 x 30) / (50 + 30)**

**= (3000/80) = 37. 5 km/hr**

1. **Distance between two stations A and B is 778 km. Mohan covers the journey from A to B at 84 km per hour and returns back to A with a uniform speed of 56 km per hour. Find his average speed during the whole journey?**

**Average speed = 2xy /(x + y) km/hr**

**= (2 x 84 x 56) /(84 + 56) = (2 x 84 x 56) / 140 = 67.2 km/hr**

1. **The average of 11 results is 60. If the average of first six results is 58 and that of the last six is 63, find the sixth result?**

**Sixth result = (total of 12 results) – (total of 11 results)**

**= (6 x 58 + 6 x 63) – (11 x 60) = 348 + 378 – 660 = 66**

1. **The average weight of A, B and C is 45 kg. If the average weight of A and B is 40 kg and that of B and C is 43 kg, then find the weight of B?**

**A + B + C = 45 x 3 = 135 kg**

**A + B = 40 x 2 = 80 kg and B + C = 43 x 2 = 86 kg**

**Therefore B = (A + B) + (B + C) - (A + B + C) = 80 + 86 – 135 = 31 kg**

1. **There are two sections A and B of a class, consisting of 36 and 44 students respectively. If the average weight of section A is 40 kg and that of section B is 35 kg, find the average weight of the whole class?**

**Total weight of 80 students = (36 x 40 + 44 x 35) = 2980 kg**

**Therefore average weight = (2980 / 80) = 37.25 kg**

1. **Nine persons went to a hotel for taking their meals. Eight of them spent Rs 120 each on their meals and the ninth person spent Rs 80 more than the average expenditure of all the nine. What was the total money spent by them?**

**Let the total expenditure be Rs x. Then, average expenditure = Rs (x/9)**

**Then 8 x 120 + [(x/9) + 80] = x (or) (x) – (x/9) = 1040**

**Or (8x/9) = 1040 (or) x = 1040 (9/8) = Rs 1170 (This is the total money spent by them)**

1. **The average of 5 numbers is 7. When 3 new numbers are added, the average of the eight numbers is 8.5. The average of the three new numbers is:**
2. **11 (b) 8.5 (c) 7.75 (d) 7**

**Sum of three new numbers = sum of eight numbers – sum of five numbers.**

**Implies (8.5 x 8) – (5 x 7) = 68 – 35 = 33**

**Their average = 33 / 3 = 11**

1. **The average age of 30 students is 9 years. If the age of their teacher is included, it becomes 10 years. The age of the teacher (in years) is:**
2. **27 (b) 31 (c) 35 (d) 40**

**Age of teacher = (31 x 10) – (30 x 9) = 310 – 270 = 40**

1. **The average age of 24 boys and the teacher is 15 years. When the teacher’s age is excluded, the average decreases by 1. What is the age of the teacher?**
2. **38 years (b) 39 years (c) 40 years (d) 41 years**

**Sum of ages of all students & teacher = 25 x 15 = 375 years**

**Sum of ages of students only = 24 x 14 = = 336 years**

**Therefore, age of teacher = 375 – 336 = 39 years**

1. **The average weight of 29 students is 28 kg. By the admission of a new student, the average weight is reduced to 27.8 kg. The weight of the new student is:**
2. **22.4 kg (b) 22 kg (c) 21.6 kg (d) 21 kg**

**Weight of new student = (30 x 27.8) – (29 x 28) = 22 kg**

1. **The average salary per month of 30 employees in a company is Rs40000. If the manager’s salary is added, the average salary increases to Rs43000. What is the salary of the manager?**
2. **Rs100000 (b) Rs120000 (c) Rs130000 (d) Rs133000**

**Salary of the manager = (43000 x 31) – (40000 x 30) = Rs133000**

1. **The average age of 40 students of a class is 15 years. When 10 new students are admitted, the average is increased by 0.2 years. The average age of new students is:**
2. **15.2 years (b) 16 years (c) 16.2 years (d) 16.4 years**

**Sum of age of 40 students = 40 x 15 = 600 years**

**Sum of age of 50 students = 50 x 15.2 = 760 years**

**Sum of age of 10 new students = 760 – 600 = 160 years**

**Their average = (160 / 10) = 16 years**

1. **The average weight of 8 men is increased by 1.5 kg when one of the men who weighs 65 kg is replaced by a new man. The weight of the new man is:**
2. **76 kg (b) 76. 5 kg (c) 76.7 kg (d) 77 kg**

**Total weight increased = (8 x 1.5) = 12 kg**

**Weight of new man = 65 + 12 = 77 kg**

1. **The average weight of 9 mangoes increases by 20 g if one of them weighing 120 g is replaced by another. The weight of the new mango is:**
2. **180 g (b) 200 g (c) 260 g (d) 300g**

**Total weight increased = 9 x 20 = 180 g**

**Weight of new mango = 120 + 180 = 300 g**

1. **The average weight of 6 men decreased by 3 kg when one of them weighing 80 kg is replaced by a new man. The weight of the new man is:**
2. **56 kg (b) 58 kg (c) 62 kg (d) 76 kg**

**Total weight decreased = 6 x 3 = 18 kg**

**Weight of new man = 80 – 18 = 62 kg**

1. **The average age of a committee of 8 members is 40 years. A member aged 55 years retired and his place was taken by another member aged 39 years. The average age of the present committee is:**
2. **35 years (b) 36 years (c) 38 years (d) 39 years**

**Total weight initially = 40 x 8 = 320 years**

**Changes happened = - 55 + 39 = - 16 years**

**New total = 320 – 16 = 304 years**

**New average = (304 / 8) = 38 years**

1. **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 the average weight of B, C, D and E becomes 79 kg. The weight of A is:**
2. **70 kg (b) 72 kg (c) 75 kg (d) 80 kg**

**A + B + C = 84 x 3 = 252 kg (and) A + B + C + D = 80 x 4 = 320 kg**

**Therefore D = 320 – 252 = 68 kg**

**E = 68 + 3 = 71 kg**

**B + C + D + E = 79 x 4 = 316 kg**

**A + B + C + D + E = 320 + 71 = 391 kg**

**Therefore, weight of A = 391 – 316 = 75 kg**

1. **Three years ago, the average age of A, B and C was 27 years and that of B and C, 5 years ago was 20 years. A’s present age is:**
2. **30 years (b) 35 years (c) 40 years (d) 48 years**

**Present age of (A + B + C) = (27 x 3) + (3 x 3) = 90 years**

**Present age of (B + C) = (20 x 2) + (5 x 2) = 50 years**

**A’s present age = 90 – 50 = 40 years**

1. **Five years ago, the average age of A, B, C and D was 45 years. With E joining them now, the average of all the five is 49 years. How old is E?**
2. **25 years (b) 40 years (c) 45 years (d) 64 years**

**5 years ago, (A + B + C + D) = 45 x 4 = 180 years**

**Now, (A + B + C + D) = (180 + 5 x 4) = 200 years**

**Now, (A + B + C + D + E) = 49 x 5 = 245 years**

**Now E = 245 – 200 = 45 years**

1. **Five years ago, the average age of P and Q was 15 years. Average age of P, Q and R today is 20 years. How old will R be after 10 years?**
2. **30 years (b) 35 years (c) 40 years (d) 50 years**

**(P + Q), five years ago = 15 x 2 = 30 years & (P + Q), now = 30 + (5 x 2) = 40 years**

**(P + Q + R), now = 20 x 3 = 60 years & R now = 60 – 40 = 20 years**

**R after 10 years = 20 + 10 = 30 years**

1. **The mean temperature from the 9th to the 16th of January, both days inclusive, was 11.60 C and from the 10th to the 17th it was 12. 20C. The temperature on the 9th was 10.80C. What was it on the 17th?**
2. **15.60C (b) 4.80C (c) 9.60C (d) 150C**

**Total temperature from 9th to 16th of January = 8 x 11.60 C = 92.80 C**

**Total temperature from 10th to 17th of January = 8 x 12.20 C = 97.60 C**

**Therefore, temperature on 17th January = 10.80 C + 97.60 C – 92.80 C =15.60 C**

1. **The weights of four rowers of a boat are respectively 70 kg, 72 kg, 73 kg and 74 kg and the average weight of whole crew, including the coxswain is 70 kg. Find the weight of the coxswain?**
2. **61 kg (b) 62 kg (c) 63 kg (d) 68 kg**

**Weight of coxswain = 5 x 70 – (70 + 72 + 73 + 74) = 61 kg**

1. **The average weight of 19 students was 25 kg. By the admission of a new student the average weight is reduced to 24.8 kg. The weight of the new student is:**
2. **24.8 kg (b) 21 kg (c) 20.8 kg (d) 20.6 kg**

**The weight of the new student = (20 x 24.8) – (19 x 25) = 21 kg**

1. **The average of 6 numbers is 8. What is the 7th number so that average becomes 10?**
2. **22 (b) 21 (c) 20 (d) 18**

**Sum of 7 numbers = 7 x 10 = 70**

**Sum of 6 numbers = 6 x 8 = 48**

**Required number = 70 – 48 = 22**

1. **The average age of a class is 15.8 years. The average age of the boys in the class is 16.4 years while that of the girls is 15.4 years. What is the ratio of boys to girls in the class?**
2. **1 : 2 (b) 2 : 3 (c) 3 : 5 (d) 4 : 3**

**Let the number of boys and girls be ‘a and b’ respectively.**

**Total age of boys = 16.4 a**

**Total age of girls = 15.4 b**

**Total age of the class = 15.8 (a + b)**

**15.8 (a + b) = 16.4 a + 15.4b**

**16.4 a – 15.8 a = 15.8 b – 15.4 b**

* 1. **a = 0.4 b implies (a/b) = (0.4/0.6) = (2/3) = 2 : 3**

1. **Three numbers are in the ratio 4 : 5 : 6 and their average is 25. The largest number is:**
2. **30 (b) 32 (c) 36 (d) 42**

**Average is 25 means total = (25 x 3) = 75**

**Largest number = 75 (6/15) = 30**

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| **PROBLEMS ON AGES** |

1. **The ratio of the ages of Mona and Sona is 4 : 5. Twelve years after, their ages will be in the ratio of 5 : 6. What will be Sona’s age after 6 years?**

**Let their present ages be 4x and 5x. Then, (4x + 12) / (5x + 12) = 5 / 6**

**On cross multiplication we get 24x + 72 = 25x + 60 implies x = 12**

**Therefore, Sona’s age = 5x = 5 x 12 = 60**

**Sona’s age after 6 years = 60 + 6 = 66**

1. **The ratio of the ages of Meena and Meera is 4 : 3. The sum of their ages is 28 years. The ratio of their ages after 8 years will be:**
2. **4 : 3 (b) 12 : 11 (c) 7 : 4 (d) 6 : 5**

**Let Meena’s age = 4x and Meera’s = 3x**

**Then, 4x + 3x = 28……….x = 4**

**Therefore, Meena’s age = 16 years and Meera’s age = 12 years**

**Ratio of their ages after 8 years = (16 + 8) : (12 + 8) = 24 : 20 = 6 : 5**

1. **The ages of Ram and Mukta are in the ratio of 3 : 5. After 9 years, the ratio of their ages will become 3 : 4. The present age of Mukta (in years) is:**
2. **9 (b) 15 (c) 18 (d) 24**

**Let Ram’s age = 3x and Mukta’s age = 5x**

**Implies (3x + 9) / (5x + 9) = (3 / 4)**

**On cross multiplication we get 12x + 36 = 15 x + 27 it becomes 3x = 9 or x = 3**

**Mukta’s age = 5 x 3 = 15 years**

1. **A father is twice as old as his son. 20 years ago, the age of the father was 12 times the age of the son. The present age of the father (in years) is**
2. **46 (b) 44 (c) 42 (d) 40**

**Let son’s age = x, father’s age = 2x.**

**20 years ago, son was (x – 20) years and father was (2x – 20) years**

**Hence 12 (x – 20) = (2x – 20)………x = 22**

**Father’s present age = 22 x 2 = 44 years**

1. **A man is four times as old as his son. Five years ago, the man was nine times as old as his son was at that time. What is the present age of the man?**

**Let son’s age = x and man’s age = 4x**

**5 years ago, Son’s age was (x – 5) and man’s age was (4x – 5)**

**Therefore, 9 (x – 5) = (4x – 5)…..x = 8**

**Man’s present age = 4x = 4 x 8 = 32 years**

1. **The total of the ages of A, B and C at present is 90 years. Ten years ago, the ratio of their ages was 1 : 2 : 3. What is the age of B at present?**
2. **40 years (b) 30 years (c) 20 years (d) 18 years**

**Let their ages 10 years ago be x, 2x and 3x years.**

**When their present ages are added (x + 10 + 2x + 10 + 3x + 10) = 90 & we get x = 10**

**B’s present age = (2x + 10) = 30 years**

1. **The ratio of the father’s age to his son’s age is 7 : 3. The product of their ages is 756. The ratio of their ages after 6 years will be:**
2. **5 : 2 (b) 2 : 1 (c) 5 : 3 (d) 2 : 3**

**Let their ages be 7x and 3x years. Then (7x)(3x) = 756 or**

**(x)(x) = 756 / 21 = 36 or x = 6**

**Their present ages are 42 years and 18 years.**

**Ratio after 6 years = 48 : 24 = 2 : 1**

1. **The ratio of Meena’s age to the age of her mother is 3 : 8. The difference of their ages is 35 years. The ratio of their ages after 4 years will be:**
2. **7 : 12 (b) 5 : 12 (c) 4 : 7 (d) 7 : 4**

**Let their ages be 3x and 8x. Then 8x – 3x = 35 or x = 7**

**So their present ages are 21 years and 56 years.**

**Ratio after 4 years = (21 + 4) : (56 + 4) = 25 : 60 = 5 : 12**

1. **Ratio of Ashok’s age to Sandeep’s age is 4 : 3. Ashok will be 26 years old after 6 years. How old is Sandeep now?**
2. **10 years (b) 15 years (c) 20 years (d) 25 years**

**Let Ashok and Sandeep ages be 4x and 3x years. Now 4x + 6 = 26 or x = 5**

**Age of Sandeep = 3x = 3 x 5 = 15 years**

1. **The ratio of Vimal’s age and Aruna’s age is 3 : 5 and the sum of their ages is 80 years. Find the ratio of their ages after 10 years?**
2. **2 : 3 (b) 1 : 2 (c) 3 : 2 (d) 3 : 5**

**Let their ages be 3x and 5x years. Then 3x + 5x = 80 or 8x = 80 or x = 10.**

**Ratio of their ages after 10 years = (3x + 10) : (5x + 10) = 40 : 60 = 2 : 3**

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| **CHAIN RULE** |

1. **If 15 toys cost Rs 2340, what do 35 toys cost?**

**More toys, more cost (direct proportion)**

**= (35 x 2340)/15 = Rs 5460**

1. **If 36 men can do a certain piece of work in 25 days, in how many days will 15 men do it?**

**Less men, more days (indirect proportion)**

**= (36 x 25)/15 = 60 days**

1. **If 20 men working together can finish a job in 20 days, then the number of days taken by 25 men of the same capacity to finish the job is:**
2. **25 (b) 20 (c) 16 (d) 12**

**More men, less days (indirect proportion)**

**= (20 x 20)/25 = 16 days**

1. **If 10 men can reap a field in 8 days, then 8 men will reap the same field in:**
2. **4 days (b) 5 days (c) 10 days (d) 20 days**

**Less men, more days (indirect proportion)**

**= (10 x 8)/8 = 10 days**

1. **14 pumps of equal capacity can fill a tank in 6 days. If the tank has to be filled in 4 days, the number of extra pumps needed is:**
2. **7 (b) 14 (c) 21 (d) 28**

**Less days, more pumps (indirect proportion)**

**= (14 x 6)/4 = 21.**

**Therefore extra pumps needed = 21 – 14 = 7**

1. **If 20 men can build a wall 56 meters long in 6 days, what length of a similar wall can be built by 35 men in 3 days?**

**20 men ……….. 6 days ……………56 meters**

**35 men ……….. 3 days …………… ?**

**= (35/20)(3/6)(56) = 49 meters**

1. **If 15 men working 9 hours a day can reap a field in 16 days, in how many days will 18 men reap the field, working 8 hours a day?**

**15 men …………9 hours …………..16 days**

**18 men ………… 8 hours …………. ?**

**= (15/18)(9/8)(16) = 15 days**

1. **If 16 men working 7 hours a day can plough a field in 48 days, in how many days will 14 men working 12 hours a day plough the same field?**
2. **46 (b) 35 (c) 32 (d) 30**

**16 men ……………7 hours ……………48 days**

**14 men …………… 12 hours …………..?**

**= (16/14)(7/12)(48) = 32 days**

1. **If 80 lamps can be lighted 5 hours per day for 10 days for Rs 2125, then the number of lamps which can be lighted 4 hours daily for 30 days for Rs 7650 is:**
2. **100 (b) 120 (c) 150 (d) 160**

**5 hours …………..10 days ………….Rs 2125 ……….80 lamps**

**4 hours ………….. 30 days ………… Rs 7650 ……… ?**

**= (5/4)(10/30)(7650/2125)(80) = 120 lamps**

1. **If 12 carpenters, working 6 hours a day can make 460 chairs in 24 days, how many chairs will 18 carpenters make in 36 days, each working 8 hours a day?**
2. **920 (b) 1260 (c) 1320 (d) 1380**

**12 carpenters ……….. 6 hours ………… 24 days ………. 460 chairs**

**18 carpenters ……….. 8 hours ………… 36 days ……….. ?**

**= (18/12)(8/6)(36/24)(460) = 1380 chairs**

1. **Some persons can do a piece of work in 12 days. Two times the number of such persons will do half of that work in:**
2. **12 days (b) 6 days (c) 4 days (d) 3 days**

**x persons ……….. 100 units…………12 days**

**2x persons………. 50 units ………….?**

**= (x/2x)((50/100)(12) = 3 days**

1. **A certain number of men can finish a piece of work in 100 days. If however, there were 10 men less, it would take 10 days more for the work to be finished. How many men were there originally?**
2. **75 (b) 82 (c) 100 (d) 110**

**x men ………………. 100 days**

**(x – 10) men ……… 110 days**

**(less men, more days, hence indirect proportion)**

**Implies 100x = 110(x – 10) …………….110x – 100x = 1100**

**Implies 10x = 1100 or x = 110 men.**

**So, originally there were 110 men.**

1. **A certain number of men could do a piece of work in 60 days. If there were 8 more men, it could be finished in 10 days less. The number of men in the beginning were:**
2. **30 (b) 35 (c) 40 (d) 45**

**Let x men can finish the work in 60 days.**

**Then (x + 8) men can finish it in 50 days.**

**More men, less days (indirect proportion)**

**60x = 50(x + 8) implies 10x = 400 or x = 40**

**Therefore, number of men in the beginning = 40.**

1. **If 300 men can do a piece of work in 16 days, how many men would do (1/5) of the work in 15 days?**
2. **56 (b) 60 (c) 64 (d) 72**

**100 units …………16 days …………300 men**

**20 units …………. 15 days …………. ?**

**= (20/100)(16/15)(300) = 64 men**

1. **If 6 men working 8 hours a day earn Rs 8400 per week, then 9 men working 6 hours a day will earn how much per week?**
2. **Rs 8400 (b) Rs 9450 (c) Rs 16200 (d) Rs 16800**

**6 men ……….8 hours ………Rs 8400**

**9 men ………. 6 hours …….. ?**

**= (9/6)(6/8)(8400) = Rs 9450**

1. **A rope makes 70 rounds of the circumference of a cylinder whose radius of the base is 14 cm. How many times can it go round a cylinder with radius 20 cm?**

**More radius, less rounds (indirect proportion)**

**14 cm ………..70 rounds**

**20 cm ……….. ?**

**= (14 x 70)/20 = 49 rounds**

1. **If (3/5) of a cistern is filled in 1 minute, how much more time will be required to fill the rest of it?**
2. **40 sec (b) 36 sec (c) 30 sec (d) 24 sec**

**Total capacity of the cistern = 5 units (denominator value)**

**To fill 3 parts, it needs 60 sec of time (1 min)**

**To fill rest of 2 parts, it takes 40 sec of time.**

1. **Ten pipes through which water flows at the same rate can fill a tank in 28 minutes. If three pipes go out of order, how long will the remaining pipes take to fill the tank?**

**10 pipes …………..28 min**

**7 pipes …………….?**

**= (10 x 28)/7 = 40 minutes**

1. **A garrison of 500 men had provisions for 27 days. After 3 days, a reinforcement of 300 men arrived. The remaining food will now last for how many days?**
2. **15 (b) 16 (c) 17½ (d) 18**

**The remaining food is sufficient for 500 men for 24 days.**

**But, now the number of men = 500 + 300 = 800 men**

**More men, less days (indirect proportion)**

**500 men …………..24 days**

**800 men …………..?**

**= (500 x 24)/800 = 15 days**

1. **A contractor undertook to do a certain piece of work in 9 days. He employed certain number of men, but 6 of them being absent from the very first day, the rest could finish the work in 15 days. The number of men originally employed were:**
2. **12 (b) 15 (c) 18 (d) 24**

**Let there are x men at the beginning.**

**Now, less men would take more days.**

**x men ………………… 9 days**

**(x – 6) men …………. 15 days**

**9x = 15(x – 6) (or) 9x = 15x – 90 (or) 6x = 90 (or) x = 15 men**

1. **A wheel rotates 10 times every minute and moves 20 cm during each rotation. How many centimeters does the wheel move in 1 hour?**
2. **600 (b) 1200 (c) 2000 (d) 12000**

**Number of times wheel moves in 1 hour = 10 x 60 = 600**

**Therefore, distance moved = 600 x 20 = 12000 cm**

1. **The amount of time it takes to consume a buffalo carcass is inversely proportional to the number of vultures. If it takes 12 vultures 3 days to consume a buffalo, how many fewer hours will it take if there are 4 more vultures?**
2. **6 (b) 12 (c) 18 (d) 24**

**Inverse proportional means ‘when one value increases, the other value decreases’.**

**12 vultures ……… 72 hours**

**16 vultures ………? (12 x 72)/16 = 54 hours**

**Hours less = 72 – 54 = 18**

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| **CHAPTER 3. H.C.F & L.C.M. of NUMBERS** |

**H.C.F. = Highest Common Factor**

**Definition:**

**The H.C.F. of two or more numbers is the greatest number that divides each one of them exactly.**

**How to find H.C.F. of two numbers:**

**Divide the greater number by the smaller number, we will get remainder. Divide the previous divisor with this remainder, continue this process till we get zero as remainder. The last divisor is the required H.C.F.**

1. **Find the H.C.F. of 42 and 70.**

**Step 1: Divide 70 by 42. Remainder = 28.**

**Step 2: Divide 42 by 28. Remainder = 14.**

**Step 3: Divide 28 by 14. Remainder = 0.**

**Therefore H.C.F. = 14.**

1. **Find the H.C.F. of 444 and 629.**

**Step 1: Divide 629 by 444. Remainder = 185.**

**Step 2: Divide 444 by 185. Remainder = 74.**

**Step 3: Divide 185 by 74. Remainder = 37**

**Step 4: Divide 74 by 37. Remainder = 0.**

**Therefore H.C.F = 37**

**H.C.F. of more than two numbers:**

**Find the H.C.F. of any two of the numbers and then find the H.C.F. of this H.C.F. and the third number and so on. The last H.C.F. will be the required H.C.F.**

1. **Find the H.C.F. of 513, 1134 and 1215.**

**Step 1: Divide 1215 by 1134. Remainder is 81.**

**Step 2: Divide 1134 by 81. Remainder is zero.**

**Therefore, H.C.F. of 1215 and 1134 is 81.**

**Step 3 : Divide 513 by 81. Remainder is 27.**

**Step 4: Divide 81 by 27. Remainder is zero.**

**Therefore, the H.C.F. of three given numbers is 27.**

1. **Find the H.C.F. of 234, 519 and 786.**

**Step 1 : Divide 519 by 234. Remainder is 51.**

**Step 2: Divide 234 by 51. Remainder is 30.**

**Step 3: Divide 51 by 30. Remainder is 21.**

**Step 4: Divide 30 by 21. Remainder is 9.**

**Step 5: Divide 21 by 9. Remainder is 3.**

**Step 6: Divide 9 by 3. Remainder is zero.**

**Therefore, H.C.F. of 519 and 234 is 3.**

**Step 6: Divide 786 by 3. Remainder is zero.**

**Therefore, H.C.F. of three given numbers is 3.**

1. **The H.C.F. of 210, 385 and 735 is:**
2. **7 (b) 14 (c) 21 (d) 35**

**35 is the H.C.F**

**Lowest Common Multiple (L.C.M):**

**The least number which is exactly divisible by each one of the given numbers is called their L.C.M.**

1. **The L.C.M. of 26, 56, 104 and 182 is:**
2. **546 (b)728 (c) 784 (d) 1274**

**L.C.M. of given numbers is 728**

1. **Find the L.C.M. of 16, 24, 36 and 54?**
2. **108 (b) 216 (c) 432 (d) 864**

**L.C.M. of given numbers is 432.**

**H.C.F. & L.C.M. of Fractions:**

**H.C.F. of a fraction = (H.C.F. of numerators / L.C.M. of denominators)**

**L.C.M. of a fraction = (L.C.M. of numerators / H.C.F. of denominators)**

1. **Find the H.C.F. and L.C.M. of (2/3), (8/9), (16/81) and (10/27) ?**

**H.C.F. of given fractions = (H.C.F. of 2, 8, 16, 10) / (L.C.M. of 3, 9, 81, 27) = (2/81)**

**L.C.M. of given fractions = (L.C.M. of 2, 8, 16, 10) / (H.C.F. of 3, 9, 81, 27) = (80/3)**

1. **The H.C.F. of (9/10), (12/25), (18/35) and (21/40) is:**
2. **(3/5) (b) (252/5) (c) (3/1400) (d) (63/700)**

**H.C.F. = (H.C.F. of 9, 12, 18, 21) / (L.C.M. of 10, 25, 35, 40) = (3/1400)**

1. **The L.C.M. of (2/3), (3/5), (4/7), (9/13) is**
2. **36 (b) (1/36) (c) (1/1365) (d) (12/455)**

**L.C.M. = (L.C.M. of 2, 3, 4, 9) / (H.C.F. of 3, 5, 7, 13) = (36/1) = 36**

1. **Find the HCF of (54/9), (60/17) and (36/51)**

**The given fractions are (6/1), (60/17) and (12/17).**

**HCF = (HCF of 6, 60 and 12) / (LCM of 1, 17, 17) = (6/17) is the answer**

1. **What is the greatest length which is contained a whole number of times exactly in both 7½ meters and 4¼ meters?**
2. **25 cm (b) 26 cm (c) 30 cm (d) 80 cm**

**HCF of (15/2) and (17/4) = (HCF of 15 and 17) / (LCM of 2 and 4)**

**= (1/4) meters = (1/4) x 100 = 25 cm**

1. **Four bells commence tolling together, they toll at intervals of 1, 1¼, 1½ and 1¾ seconds respectively, after what interval will they toll together again?**
2. **1 min 40 sec (b) 1 min 45 sec (c) 2 min 40 sec (d) 2 min 45 sec**

**LCM of (1/1), (5/4), (3/2) and (7/4)**

**= LCM of (1, 5, 3, 7) / HCF of (1, 4, 2, 4) = (105 / 1) = 105 seconds**

**= 60 sec + 45 sec = 1 min 45 sec**

**RULE:**

**HCF of Numbers x LCM of Numbers = Product of Numbers**

1. **The HCF of two numbers is 11 and their LCM is 693. If one of the numbers is 77, find the other?**

**The other number = (11 x 693) / 77 = 99 is the answer**

1. **The HCF of two numbers is 11 and their LCM is 7700. If one of the numbers is 275, then the other one is:**
2. **279 (b) 283 (c) 308 (d) 318**

**Other number = (11 x 7700)/275 = 308**

1. **Find the largest number that can exactly divide 513, 783 and 1107?**

**Required number = HCF of 513, 783 and 1107 = 27**

1. **Find the least number exactly divisible by 12, 15, 20 and 27?**

**Required number = LCM of 12, 15, 20 and 27 = 540**

1. **Find the largest number which divides 62, 132 and 237 to leave the same remainder in each case?**

**Rule: HCF of (2nd no. – 1st no.), (3rd no. – 2nd no.), (3rd no. – 1st no.)**

**= HCF of (132 – 62), (237 – 132), (237 – 62)**

**= HCF of 70, 105 and 175 = 35 is the answer**

1. **Find the largest number which divides 25, 73 and 97 to leave the same remainder in each case?**
2. **24 (b) 23 (c) 21 (d) 6**

**Required number = HCF of (73 – 25), (97 – 73) and (97 – 25)**

**= HCF of 48, 24 and 72 = 24**

1. **Find the greatest number which will divide 187, 233 and 279 leaving the same remainder in each case?**
2. **30 (b) 36 (c) 46 (d) 56**

**Required number = HCF of (233 – 187), (279 – 233) and (279 – 187)**

**= HCF of 46, 46 and 92 = 46**

1. **Find the greatest number which can divide 284, 698 and 1618 leaving the same remainder 8 in each case?**

**Required number = HCF of (284 – 8), (698 – 8) & (1618 – 8)**

**= HCF of 276, 690 and 1610 =46 is the answer**

1. **The product of two numbers is 1320 and their HCF is 6. The LCM of the numbers is:**
2. **7920 (b) 1326 (c) 1314 (d) 220**

**LCM = (Product of numbers) / their HCF = 1320 / 6 = 220**

1. **The greatest possible length which can be used to measure exactly the lengths**

**4 m 95 cm, 9 m and 16 m 65 cm is:**

1. **15 cm (b) 25 cm (c) 35 cm (d) 45 cm**

**Required length = HCF of 495 cm, 900 cm and 1665 cm = 45 cm**

1. **The least number which when divided by 18, 27 and 36 leaves the remainders 5, 14 and 23 respectively is:**
2. **77 (b) 95 (c) 113 (d) 149**

**Here (18 – 5) = 13, (27 – 14) = 13 and (36 – 23) = 13.**

**Required number = (LCM of 18, 27, 36) – 13 = 108 – 13 = 95**

1. **The least number which when divided by 20, 25, 35 and 40 leaves the remainder 14, 19, 29 and 34 respectively is:**
2. **1664 (b) 1406 (c) 1404 (d) 1394**

**Here (20 – 14) = 6, (25 – 19) = 6, (35 – 29) = 6 and (40 – 34) = 6.**

**Required number = (LCM of 20, 25, 35, 40) – 6 = 1400 – 6 = 1394**

1. **An electronic device makes a beep after every 60 sec. Another device makes a beep after every 62 sec. They beeped together at 10 a.m. The time when they will next make a beep together at the earliest is:**
2. **10.30 a.m. (b) 10. 31 a.m. (c) 10.59 a.m. (d) 11 a.m.**

**LCM of 60 and 62 seconds = 1860 sec = 1860/60 min = 31 min**

**Therefore, they will beep together at 10.31 a.m.**

1. **Six bells commence tolling together and toll at intervals of 2, 4, 6, 8, 10 and 12 seconds respectively. In 30 minutes, how many times do they toll together?**
2. **4 (b) 10 (c) 15 (d) 16**

**LCM of 2, 4, 6, 8, 10, 12 is 120.**

**So, the bells will toll together after every 120 seconds i.e. 2 minutes.**

**In 30 minutes, they will toll together in (30/2) = 15 times.**

1. **The traffic lights at three different road crossings change after every 48 sec, 72 sec and 108 sec respectively. If they all change simultaneously at 8 : 20 : 00 hours, then they will again change simultaneously at:**
2. **8 : 27 : 12 hrs (b) 8 : 27 : 24 hrs (c) 8 : 27 : 36 hrs (d) 8 : 27 : 48 hrs**

**Interval of change = LCM of 48, 72, 108 sec = 432 sec.**

**That means the lights will change simultaneously after every 432 seconds i.e. 7 min 12 sec. That means next simultaneous change will take place at 8 : 27 : 12 hrs**

1. **A merchant has three kinds of wine – of the first kind 403 gallons, of the second 527 gallons and of the third 589 gallons. What is the least number of full casks of equal size in which this can be stored without mixing?**
2. **21 (b) 29 (c) 31 (d) 33**

**HCF of 403, 527 and 589 = 31**

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| **PARTNERSHIP** |

1. **Three partners A, B, C invest Rs 36000, Rs 45000 and Rs 54000 respectively in a business. Out of a total profit of Rs 37500, C’s share is:**

**A : B : C = 36000 : 45000 : 54000 = 4 : 5 : 6**

**Total shares to divide profit = 4 + 5 + 6 = 15**

**C’s share = 37500 x (6/15) = Rs 15000**

1. **Manoj and Vinod started a business by investing Rs 120000 and Rs 135000 respectively. Find the share of each, out of an annual profit of Rs 35700?**

**Ratio of their shares = 120000 : 135000 = 8 : 9**

**Manoj share = 35700 x (8/17) = Rs 16800**

**Vinod share = 35700 x (9/17) = Rs 18900**

1. **Kavita and Sunita are partners in a business. Kavita invests Rs 35000 for 8 months and Sunita invests Rs 42000 for 10 months. Out of a profit of Rs 31570, find Kavita’s share:**

**Ratio of their shares = (35000 x 8) : (42000 x 10) = 2 : 3**

**Kavita’s share = 31570 x (2/5) = Rs 12628**

1. **Sanjeev started a business by investing Rs 36000. After 3 months, Rajeev joined him by investing Rs 36000. Out of an annual profit of Rs 37100, find the share of each?**

**Ratio of capitals = (36000 x 12) : (36000 x 9) = 4 : 3**

**Sanjeev share = 37100 x (4/7) = Rs 21200**

**Rajeev share = 37100 x (3/7) = Rs 15900**

1. **Jayant opened a shop investing Rs 30000. Madhu joined him 2 months later, investing Rs 45000. They earned a profit of Rs 54000 after completing of one year. What will be Madhu’s share of profit?**

**Jayant : Madhu = (30000 x 12) : (45000 x 10) = 4 : 5**

**Madhu’s share = 54000 x (5/9) = Rs 30000**

1. **Nirmal and Kapil started a business investing Rs 90000 and Rs 120000 respectively. After 6 months, Kapil withdrew half of his investment. If after a year, the total profit was Rs 46000, what was Kapil’s share in it?**

**Nirmal : Kapil = (90000 x 12) : (120000 x 6) + (60000 x 6) = (108) : (72 + 36)**

**= 108 : 108 = 1 : 1**

**Kapil’s share = 46000 x (1/2) = Rs 23000**

1. **Yogesh started a business investing Rs 45000. After 3 months, Pranab joined with a capital of Rs 60000. After another 6 months, Atul joined them with a capital of Rs 90000. At the end of the year, they made a profit of Rs 200000. What would be Atul’s share in it?**

**Yogesh : Pranab : Atul = (45000 x 12) : (60000 x 9) : (90000 x 3)**

**= (45 x 12) : (60 x 9) : (90 x 3) = 540 : 540 : 270 = 2 : 2 : 1**

**Atul’s share = 200000 x (1/5) = Rs 40000**

1. **Mohinder and Surinder entered into a partnership investing Rs 120000 and Rs 90000 respectively. After 3 months, Sudhir joined them with an investment of Rs 150000. What is the share of Sudhir in a half-yearly profit of Rs 95000?**

**Mohinder : Surinder : Sudhir = (120000 x 6) : (90000 x 6) : (150000 x 3)**

**= 72 : 54 : 45 = 8 : 6 : 5**

**Sudhir’s share = 95000 x (5/19) = Rs 25000**

1. **Manoj received Rs 60000 as his share out of the total profit of Rs 90000 which he and Ramesh earned at the end of one year. If Manoj invested Rs 200000 for 6 months, whereas Ramesh invested his amount for the whole year, what was the amount invested by Ramesh?**

**Suppose Ramesh invested Rs x. Then Manoj : Ramesh = (200000 x 6) : (x) (12)**

**Or (1200000)/12x = (60000/30000) Or 100000/x = (2/1)**

**Or x = 100000 x (1/2) = Rs 50000**

1. **A started a business with Rs 21000 and is joined afterwards by B with Rs 36000. After how many months did B join, if the profits at the end of the year are divided equally?**

**Suppose B joined after x months. Then B’s money was invested for (12 – x) months.**

**21000 x 12 = 36000 (12 – x) or 36x = 180 or x = 5**

**So, B joined after 5 months.**

1. **Three partners A, B and C start a business. Twice A’s capital is equal to thrice B’s capital and B’s capital is four times C’s capital. Out of a total profit of Rs 165000 at the end of the year, B’s share is:**

**Let C = x. Then B = 4x and 2A = 3(4x) = 12x (Or) A = 6x. Therefore**

**A : B : C = 6x : 4x : x = 6 : 4 : 1**

**B’s capital = 165000 x (4/11) = Rs 60000**