**Campus to Corporate C2C @CTD**

**Concepts**

**Of**

**Day**

**Explained**

**Logic Lessons 17**

**I. General Reasoning**

**P, Q, R and S are playing a game of table tennis (mixed doubles), such that:**

**There are two pairs of siblings: P & Q and R & S.**

**Q is directly across the net from R.**

**S is diagonally across the net from the worst player’s sibling.**

**The best player and the worst player are on the same side of the net.**

**Who is the best player?**

|  |  |
| --- | --- |
| Answer | Q |
| Explanation | **From b,** Q is directly across R ----- ❶  **From c,** S is diagonally across P/if Q is the worst player ----- ❷  or S is diagonally across Q/if P is the worst player ----- ❸  or S is diagonally across R/if S is the worst player ----- ❹  Combining ❶, ❷, ❸ & ❹, we get only the following two possibilities:  S P – worst player  R Q – best player  worst player -S P  best player - Q R  In both the cases, ‘Q’ is the best player |
| Level of Difficulty | Medium |
| Test | General |

**II. Numerical Reasoning**

**A, B and C started going to the *Shadows Salon* last month. The way in which they visit the salon is as follows:**

**One of them goes to the salon every 2 days, another one visits every 3 days, and the third one goes every 7 days.**

**A went to the salon for the first time in this month on a Monday, B went for the first time in this month on a Wednesday, and C went for the first time in this month on a Friday.**

**All three of them went at the salon on the same day this month, which was where they met.**

**When did they meet? (day of this month)**

|  |  |
| --- | --- |
| Answer | 27th |
| Explanation | The person who visits every 2 days visits the salon for the first time this month on the 1st or the 2nd, depending whether this person visits the salon for the last time in the previous month on the penultimate or the last day respectively.  Similarly, the person goes every 3rd day visits the salon for the first time this month on the 1st, 2nd or 3rd, depending upon whether this person visits the salon for the last time in the previous month on the third last, penultimate or last day respectively.  From *b* the first and the third day of this month need to be a Monday and a Wednesday respectively OR a Wednesday and a Friday respectively. Thus, the person visiting every second day will visit on the 1st, and the person visiting every 3rd day will visit on the 3rd, because they need to be separated by a day.  Case I: 1st day of this month is a Monday  In this case A goes to the salon on the 1st and then every 2 days; B goes to the salon on the 3rd day and then every 3 days; C goes on the 5th and thus every 7 days. So, the visiting pattern in this case is as follows:  A: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31  B: 3, 6, 9, 12, 15, 18, 21, 24, 29, 30  C: 5, 12, 19, 26  Note: The dates which are underlined will depend on the type of month. For example: 29, 30 and 31 are not possible for a leap month; 31 is not possible for months ending in 30 days.  Case II: 1st day of this month is a Wednesday  In this case B goes on the 1st and then every 2 days; C goes on the 3rd and then every 3 days; A goes on the 6th and then every 7 days. The visiting pattern is as follows:  B: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31  C: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30  A: 6, 13, 20, 27  Out of the two cases, case I is ruled out because it does not satisfy condition *c* which states that they all meet on a particular day this month. Thus, only case II is possible, and they meet on the 27th of this month. |
| Level of Difficulty | Difficult |

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**Concepts**

**Of**

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**Quantitative Quest I - 17**

**Arithmetic – Reviser II**

**C**oncepts **O**f **D**ay **E**xplained

**This module aims to recapitulate some of the fundamentals covered in the vast domain of *Arithmetic*. Underlying concepts have been explained in previous modules. Questions have been sourced from the following concept areas:**

**Profit/Loss**

**Ratios**

**Variation**

**Proportion**

**Concept Builders**

**Q1. A grocer bought 80 kg of sugar for Rs. 384 and was obliged to sell it at a loss of as much money as received for 16 kg. Find the sale price per kg (Rs.).**

**6**

**8**

**10**

**4**

|  |  |
| --- | --- |
| Answer | Option d |
| Explanation | Sale proceeds = Cost price – Loss  Let selling price per kg be *x.*  🡪 80 x = CP – 16x  🡪 80x+16x = 384  🡪 x = 4 |
| Level of Difficulty | Easy |

**Q2. The cost price of an article is 80% of the price at which it is marked for sale. How much does the tradesman gain after allowing a discount of 12%?**

**5%**

**8%**

**9%**

**10%**

|  |  |
| --- | --- |
| Answer | Option d |
| Explanation | Let the marked price be *x*.  The cost price would then be 0.8x and discount = 12% of x = 0.12x  Sale proceeds = x-0.12x = 0.88x  Profit margin = 0.88x-0.8x = 0.08x.  %gain = \*100 = 10  Hence, option d. |
| Level of Difficulty | Medium |

**Q3. By selling oranges at 32 for a rupee, a man loses 40%. How many for a rupee should he sell in order to gain 20%?**

|  |  |
| --- | --- |
| Answer | Option b |
| Explanation | Selling price of an orange = 1/32  Let cost price be x.  🡪 0.6x = 1/32  If gain is 20%, then SP = 1.2x = 2 \* 0.6x = 2 \* 1/32 = 1/16.  Thus, he should sell 16 oranges for a rupee.  Hence, option b |
| Level of Difficulty | Easy |

**Q4. A person sold two shirts each for Rs. 880. On one he gained 10% and on the other he lost 20%. What is the overall profit or loss percentage?**

|  |  |
| --- | --- |
| Answer | Loss 7.36% |
| Explanation | Total SP = 880 \* 2 = 1760  Let *x* be the CP of the shirt sold at a gain of 10%.  🡪 x\*1.1 = 880  🡪 x = 800  Let *y* be the CP of the shirt sold at a loss of 20%.  🡪 y\*0.8 = 880  🡪 y = 1100  🡪 Total CP = x+y = 800+1100 = 1900  🡪 Loss = CP – SP = 1900-1760 = 140  Loss% = \*100 = 7.36% |
| Level of Difficulty | Easy |

**Q5. The ratio between two numbers is 2:3. If 12 is added to these numbers, the ratio would become 3:4. Find the numbers.**

|  |  |
| --- | --- |
| Answer | 24 & 36 |
| Explanation | Let the numbers be 2x and 3x  🡪 =  🡪 8x+48 = 9x+36  🡪 x = 12  So, the numbers are 2\*12 = 24, 3\*12 = 36 |
| Level of Difficulty | Easy |

**Q6. If a: b = 2:3 and b:c = 2:3. Find a: b: c.**

|  |  |
| --- | --- |
| Answer | 4:6:9 |
| Explanation | Given, a: b = 2:3 🡪 a:b = 4:6 ----- ❶  Also, given b:c = 2:3 🡪 b:c = 6:9 ----- ❷  From ❶ & ❷, a:b:c = 4:6:9 |
| Level of Difficulty | Easy |

**Q7. The ratio between the monthly salaries of A and B is 5:3. If they together earn Rs. 24,800 per month, what is the annual salary of A?**

|  |  |
| --- | --- |
| Answer | 1,86,000 |
| Explanation | Let the salaries of A and B be 5x and 3x respectively  🡪5x+3x = 24800  🡪 8x = 24800  🡪 x = 3100  Monthly salary of A = 5\*3100 = 15500  Annual salary = 15500\*12 = 186000 |
| Level of Difficulty | Easy |

**Q8. The expenditure of a person varies as the square of his income. Last year his income was Rs. 2400 and expenditure Rs. 1500. If thus year his income and expenditure are the same, what is his income.**

|  |  |
| --- | --- |
| Answer | Rs. 3840 |
| Explanation | E = KI2  🡪 1500 = k(2400)2  🡪 K = 1/3840  Now E = I  🡪 I = KI2  🡪 I = 1/k = 3840 |
| Level of Difficulty | Medium |

**Q9. If the ratio of A to B and ratio of X to Y are both equal 1/3, find the ratio of (A+X) to (B+Y)**

**5/6**

**1/12**

**1/3**

**½**

|  |  |
| --- | --- |
| Answer | Option c |
| Explanation | =  =  🡪 =  Hence, Option c |
| Level of Difficulty | Easy |

**Q10. If a/4 = b/3 = c/14, then is equal to:**

**3.5**

**7**

**3**

**5**

|  |  |
| --- | --- |
| Answer | Option b |
| Explanation | Given,  a/4 = b/3 = c/14  Then each ratio is equal to sum of numerators divided by sum of denominators.  🡪 a/4 = b/3 = c/14 =  🡪 b/3 =  🡪 = 21/3 = 7  Hence, option b |

**Q11. Find the number which when added to each of the numbers 6, 8, 10, 13 will make them proportional.**

|  |  |
| --- | --- |
| Answer | Option b |
| Explanation | Let the number be x.  Therefore, =  Solving, we get x = 2 |
| Level of Difficulty | Medium |

**Q12. The pressure (P) of the wind on a sail varies jointly as the area (A) of the sail and the square of the velocity (V) of the wind. The pressure on a square metre is 1 kg when the velocity is 16 kmph. The velocity of the wind when the pressure on a square metre is 36 kg is:**

1. **10 kmph**
2. **96 kmph**
3. **32 kmph**
4. **1 kmph**

|  |  |
| --- | --- |
| Answer | Option b |
| Explanation | P ∞ AV2  ∴ P=k.A. V2 (k = constant)  Now 1 = k.1.162  ∴ k = 1/162 = 1/256  If P=36, A=1, and k = 1/256, then 36 = .1. V2  ∴ V2 = 256 x 36  ∴ V = 16 x 6 = 96 kmph |
| Level of Difficulty | Medium |

**Q13. The output V of a power station at time T is inversely proportional to the square of the number between T and midday. T is expressed in hours on the 24-hour clock system. Which of the following shows the relationship between V and T?**

1. **V ∞**
2. **V ∞**
3. **V ∞ 2**
4. **V ∞ 2**

|  |  |
| --- | --- |
| Answer | Option d |
| Explanation | Midday corresponds to 12 o’ clock  Therefore V ∞ 2 |
| Level of Difficulty | Easy |

**Q14. *x* varies directly as square of *y*. When y = 12, x is 452. Find x when y = 18.**

|  |  |
| --- | --- |
| Answer | 1017 |
| Explanation | x ∞ y2 or x = ky2  🡪 452 = k (12)2 or k = 452/144  🡪 x = y2  When y = 18,  x = 324 \* (452/144) = 1017 |
| Level of Difficulty | Easy |

**Q15. The volume of a solid figure is proportional to the square of its radius when height is constant and the height when radius is constant. When the radius of the solid is 7 units and height 9 units, the volume is 1386. Find the volume of the solid when radius is 14 units and height is 3 units.**

|  |  |
| --- | --- |
| Answer | 1848 |
| Explanation | V ∞ r2, V ∞ h  🡪 V ∞ r2h  🡪 V = kr2h  🡪 1386 = k(7)2\*9  🡪 k = 154/49 = 22/7  Required volume, V = 22/7\*142\*3 = 1848 |
| Level of Difficulty | Easy |

**Q16. A father divided Rs. 62,500 among his four sons such that four times the share of the first son, three times the share of the second son, two times the share of the third son and the fourth son’s share are equal. Find the share of each son.**

|  |  |
| --- | --- |
| Answer | 7500, 10000, 15000, 30000 |
| Explanation | Given, 4S1 = 3S2 = 2Ss3 = S4  Therefore, S1:S2: S3:S4 = 6:8:12:24 = 3:4:6:12  S1 = (3/25)62500 = 7500  S2 = (4/25)62500 = 10000  S3 = (6/25)62500 = 15000  S4 = (12/25)62500 = 30000 |
| Level of Difficulty | Medium |