QA - 1 : Arithmetic – 1

Career Launcher

Workshop

Number of Questions : 25

WSP–0001/18

1. A family of 4 people consumes certain quantity of rice. The price of rice increases by 12.5%. One day 2 guests came to visit the family. That day, the family consumed the same quantity of rice, while the guests consumed $\frac{2}{5}$ th the amount of rice consumed by the family. Find the percentage change in the family's expenditure.
(1) 37.5% increased
(2) 57.5% increased
(3) 37.5% decreased
(4) 35% decreased

2. In a city the consumption of rice is 7 times the consumption of wheat. If X% more rice and Y% more wheat is consumed, the aggregate amount consumed would be 9Z% more; but if Y% more rice and X% more wheat is consumed, the aggregate amount consumed would be 3Z% more. Find the ratio between X and Y.
(1) 5 : 1 (2) 4 : 1
(3) 7 : 1 (4) 1 : 3

3. Kapil saves a certain part of his income every year, so that he can purchase a house in 15 years. By what percent must he increase his savings, so that he can purchase the same house at same price 10 years later?
(1) 37.5% (2) 30%
(3) 33.33% (4) 50%

4. A man wants to invest Rs.16850 splitting between his two sons aged 12 years and 16 years, in such a way that they would get equal amount when they are 80. If the compounded rate of return is $\frac{100}{3}$% per annum, then find the share of the younger son.
(1) 4050 (2) 12800
(3) 6050 (4) 14500

5. A shopkeeper wants to make some profit by selling rice. He contemplates various methods some of which are written below. Which of the following would maximize his profit?
i. Sell rice at a profit of 15.5%.
ii. Use a 900 gram weight instead of a 1 kg weight.
iii. Mix 10% impurities in rice and then sell it at a profit of 5%.
iv. Increase the price by 5% and reduce the weight by 5%.

(1) i or iii (2) ii
(3) ii, iii and iv (4) Profits are same

6. If Asif offers a 40% discount on the marked price, then he makes a loss of 16.66%. What is the % age of impurities that has to be mixed to gain a 10% profit after the discount?
(1) 27% (2) 24.24%
(3) 32% (4) 43.25%

7. In an election contested by 2 parties A and B, there were 2400 eligible voters. Party A was expected to win the election. However, on election day 33.33% of the people who wanted to vote for A were kidnapped. Party B was also able to influence some of the remaining Party A's voters and thus double the strength of its votes as compared to its initial strength of zero votes. Party A lost by a majority which was half of that by which it would have won, had the elections been fair. How many people finally voted for party A and party B respectively?
(1) 600-A, 1200-B (2) 300-A, 600-B
(3) 450-A, 900-B (4) 600-A, 900-B

8. Rahul and Sonali each buy a goods for Rs. 1000 and Rs. 2000 respectively. Rahul marks up his goods by a% and offers no discount, while Sonali marks up her goods by 2a% and offers a discount of a%. If both makes the same nonzero profit, find a.
(1) 12.5% (2) 20%
(3) 25% (4) 30%

9. A merchant buys 40 articles, each at Rs. 20. He sells a of them at a profit of a% and remaining at a profit of (100 – a)%. What is the minimum profit the merchant could have made on this trade?
(1) 1025 (2) 295
(3) 310 (4) 975

10. Yogesh buys some items at Rs. 20 per item. The particular good is a part of an overall collection and the value is linked to the number of items that are already in the market. So the merchant sells the first item for Rs. 2, second for Rs. 4, third for Rs. 6 and so on. If he wants to make overall profit of 40%, what is the minimum number of items he should sell?
(1) 39 (2) 32
(3) 18 (4) 27

11. Two cogged wheels working into each other have 48 cogs and 72 cogs. If the latter turns 120 times in $\frac{3}{4}$ th of a minute's time, how often does the former turn in 12 seconds?
(1) 24 (2) 135
(3) 48 (4) None of these

12. A, B and C get into a partnership for a year by investing Rs. 7200, Rs. 8800 and Rs. 5600 respectively. A is a working partner and gets $\frac{1}{4}$ th of the total profit for his services and the remaining profit is divided among the three in the ratio of their investments. What is the amount of profit that B gets if A gets a total of Rs. 11988?
(1) Rs. 4992 (2) Rs. 9768
(3) Rs. 7326 (4) Rs. 11880

13. If a sum of money grows to $\frac{676}{441}$ times when invested for two years in a scheme where interest is compounded annually, how long will the same sum of money take to triple itself if invested at the same rate of interest in a scheme where the interest is computed using the simple interest method?
(1) 12 years (2) 8.4 years
(3) 10.5 years (4) 15 years

14. There are six different positive integers and their sum is 66. Out of these six numbers – one number is the average of all numbers, one number is the difference between the highest and the lowest numbers. What can be the maximum value of the highest number of this set?
(1) 20 (2) 22
(3) 25 (4) 26

15. The selling prices of two horses are equal. While one is sold at a 10% profit, the other is sold at a 20% loss. What is the overall % profit or loss?
(1) 7.37% profit (2) 7.37% loss
(3) 92.63% profit (4) 92.63% loss

16. Let a, b, c, d be real numbers satisfying $\frac{a}{b}=\frac{b}{c}=\frac{c}{d}=\frac{d}{a}$.

Find the value of $\frac{a+b+c+d}{a+b+c-d}$.

(1) –1 (2) 0
(3) 2 (4) 0 or 2

17. A man is selling milk at a certain profit. He adds 20% of water to it and increases the selling price by 7.14% and as a result his profit increases by 100%. What was his usual profit %?
(1) 40% (2) 55.55%
(3) 60% (4) Cannot be determined

18. There are 8 positive integers. Each of the mean, median, mode and range of this set are 8. The largest integer in this set could be
(1) 12 (2) 14
(3) 15 (4) 16

19. In a faulty balance scale, with unequal pan weights, it requires 16 kg to balance an article, if article placed on the left pan. If article is placed on the right pan, it requires only 9 kg to balance it. What is the actual weight of the article?
(1) 7 (2) 12
(3) 11.5 (4) 12.5

20. In a certain class the number of girls is exactly between 60% and 65% of the total students of that class .What can be the minimum number of students in that class ?
(1) 7 (2) 8
(3) 11 (4) 12

21. A fruit seller purchased some apples and mangoes at the same price, and planned to sell mangoes at 20% profit and apples at 30% profit. He made certain baskets of apples and mangoes. Every basket had equal numbers of apples and Mangoes. He realized that from each basket he has a profit of 24%. He sold the remaining apples at a profit of 30% profit. On the whole he made a profit of 25%.What was the ratio of the number of apples to that of the number of mangoes which he purchased?
(1) 1 : 1 (2) 2 : 3
(3) 3 : 2 (4) 4 : 3

22. In a certain locality, four-sevenths of total men are widowers and seven-elevenths of total women are widows. The number of widowers is twice that of number of widows. What fraction of the total population of the locality are not widows?

(1) $\frac{4}{11}$ (2) $\frac{6}{11}$

(3) $\frac{8}{71}$ (4) $\frac{57}{71}$

23. The ratio of the marked prices of A and B is 5 : 6. If A is sold at a x % discount and B is sold at a y% discount, their selling prices are in the ratio 18 : 21.6. If their cost prices are in the ratio 3:4, find the ratio of their profit %.
(1) 1 : 1 (2) 5 : 6
(3) 4 : 5 (4) Cannot be determined

24. In a class of 35 students the average weight is 35 kg. Ajay left the class and the average increased and it was an integer. Thereafter, Bala and Charu joined the class. The average now decreased but it was again an integer. What is the minimum sum of the ages of the three, if no two of these averages are the same? _____

25. Samrat Ashok had ten chiefs, who each had to pay obligeance to him. They were numbered 1 to 10 and the chief with number n had to give him n gold coins each weighing 10 gms. The total gold weight of all coins received turned out to be 532 gms. Ashok's ministers found that more than two chiefs had mixed brass with the gold and reduced the gold weight of each coin by a small amount, that is 20%. If the Chief numbered 1 was not involved in it, then what were the numbers of the Chiefs who gave the counterfeit coins?

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QA - 1 : Arithmetic – 1
Answers and Explanations

1	2	**2**	1	**3**	4	**4**	1	**5**	1	**6**	3	**7**	1	**8**	3	**9**	3	**10**	4
11	3	**12**	3	**13**	2	**14**	3	**15**	2	**16**	4	**17**	1	**18**	2	**19**	4	**20**	2
21	1	**22**	3	**23**	4	**24**	–	**25**	–										

1. 2 Let each member consumes 100 gram rice and the price of 100 gram rice is 100 rupees.
Initial consumption = 400 grams or 400 rupees.
Now, Increased price = 112.5 rupees per 100 gram.
Consumption by family = 400 gram or 450 rupees.
Consumption by guests = $400 \times \frac{2}{5}$ gram = 160 grams or 180 rupees.
Thus, final expenditure = 450 + 180 = 630 rupees.
Hence, an increase 57.5% is measured.

2. 1 Let consumption of wheat = 100 gram and rice = 700 grams.
Now, from given condition
$7x + y = 9z$
$7y + x = 3z$
$\Rightarrow$ Ratio x : y = 5 : 1.

3. 4 Let Kapil saves 1 rupee per year. So, price of house becomes 15 rupees. Now, he decides to buy it in 10 years. So, he'll have to save 1.5 rupees per year. Which is an increase of 50%.

4. 1 Apply compound interest for Bank transactions.

5. 1 Use options and get the correct choice.

6. 3 $\frac{5}{6} = 0.6 \times (MF)_{mark-up}$

Now, $\frac{11}{10} = 0.6 \times (MF)_{mark-up} \times (MF)_{mark-up}$

$(MF)_{mark-up} = \frac{11}{10} \times \frac{6}{5} = \frac{66}{50} = \frac{132}{100}$

$\Rightarrow$ 32% impurity.

7. 1 We can go by options
(a) 600 voted for A and 1200 for B.
Before influencing
A = 600 + 600 = 1200
B = 1200 – 600 = 600
Before Kidnapping
A = 1800
(as $\frac{1}{3}$ of A's voters were kidnapped which is half of the $\frac{2}{3}$ that remained)
Thus, total voters intially = 1800(A) + 600(B) = 2400

8. 3 S.P. of Rahul = 1000(1 + x).
Profit of Rahul = 1000(1 + x) – 1000
M.P. of Sonali = 2000(1 + 2x)
S.P. of Sonali = 2000(1 + 2x) (1 – x)
Profit of Sonali = 2000(1 + 2x)(1 – x) – 2000
Both made the same profit. So on equating both's profit, we get x = 25%

9. 3 A articles $\rightarrow$ a% of 20
(40 – a) articles $\rightarrow$ (100 – a)% of 20
CP = 40 × 20 rupees
Now, total profit = a% × 20 × a + (100 – a)% × 20 × (40 – a) and we've to minimise the total profit. For this, we'll find the value of a for which profit is minimum and it will give a minimum profit of 310 rupees.

10. 4 Let Yogesh buys n items.
$\therefore$ Total C.P. = 20n
Total SP = 2 + 4 + 6 + 8 + ... + n items
From given condition 2 + 4 + 6 + 8 + ... + n terms $\geq$ 1.4 × 20n
$n(n + 1) \geq 28n$
$n \geq 27$
He should sell a minimum of 27 items.

11. 3

	Cogs	Time	Turns
A $\rightarrow$	72	45 sec	120
B $\rightarrow$	48	12 sec	?

Number of turns required = $120 \times \frac{72}{48} \times \frac{12}{45} = 48.$

12. 3 Let x be the profit
Their investment ratio = 9 : 11 : 7

A's profit of Rs. 11988 = $\frac{1}{4}x + \frac{1}{3} \times \frac{3}{4} \times x$

$11988 = \frac{x}{2}$

x = 23976

$\therefore$ B's profit = $\frac{11}{27} \times 23976 \times \frac{3}{4}$ = Rs. 7326.

13. 2 $676 = 441(1 + r\%)^2 \Rightarrow r\% = \frac{5}{21}$

Now, for simple interest,

$2 = \frac{5}{21} \times t \Rightarrow t = \frac{42}{5}$

t = 8.4 years.

14. 3 To find the maximum possible value, lets smallest number of the set be 1, 2, 3.
11, 1, (1 + x), x, 2, 3.
Thus, 11 + 1 + (1 + x) + (x) + 2 + 3 = 66
$\Rightarrow$ x = 24
Thus, largest number = 25.

15. 2 Let the S.P. of each horse is 88 rupees (L.C.M. 8, 11)
So, total SP = 176 rupees
C.P. of 1st horse = 80 and CP of second horse = 110
Thus, total C.P. = 190
$\Rightarrow$ Loss of 7.37%

16. 4 a, b, c and d are in G.P.
So, the possible value are a = b = c = d = 1 or a = 1, b = –1, c = 1 and d = –1.
$\Rightarrow \frac{(a+b+c+d)}{(a+b+c-d)}$ = 2 or 0 respectively.

17. 1 Assume the initial selling price of milk (before adding water) was 14 rupees (As 7.14 % increase = $\frac{1}{14}$ increase)
So, finally it would be 15 rupees and then we will get the final amount as 18 rupees
Since from 14 to 18, there is an increase of 4 rupees which represents 100 % increase.
Hence, initial cost would be 10 rupees and S.P. would be 14 rupees.
Thus, 40% profit.

18. 2 Since, range is 8. So, the difference between maximum and minimum must be 8 and we've to keep median and mode equals to 8. So, the possible combination is x + x + x + 8 + 8 + 8 + 8 + (x + 8) = 64.
$\Rightarrow$ x = 6
Thus, maximum possible number is 14.

19. 4 $16 + P_1 = A + P_2$ and $A + P_1 = 9 + P_2$ where P_1 and P_2 represent the weights of Pan 1 and Pan 2 respectively. On solving, we get A = 12.5 kg.

20. 2 $\frac{5}{8} = 62.5\%$

$\Rightarrow$ 8 would be the minimum number of students in that class.

21. 1 By careful observation, we can say that the ratio of number of apples to that of number of mangoes must be 1 : 1.

22. 3 Total men $\rightarrow$ x $\Rightarrow$ widowers = $\frac{4}{7}x$

Total women $\rightarrow$ y $\Rightarrow$ widows = $\frac{7}{11}y$

$\Rightarrow$ Not widow = $\frac{4}{11}y$

From question $\frac{4}{7}x = 2x$

$\frac{7}{11}y \Rightarrow \frac{x}{y} = \frac{49}{22}$

$\therefore$ Total population = 71 out of which 8 are widows

$\Rightarrow \frac{8}{71}$

23. 4 Cannot be determined.

24. Minimum possible sum is 37, as minimum for Ajay can be 1 kg.

25. Actually it should be 550 gms but it weighs 532 gms. So, we are short by 18 gms.
18 = 20 % 0f 90. So the sum of the weights submitted by more than two chiefs must be 20,30,40 (This is the only option).
Hence Chief 2, 3, 4 gave the counterfeit coins.