# QA - 2 : Arithmetic – 2

Career Launcher

Workshop

**Number of Questions : 25**

**WSP–0002/18**

1. A and B are running between the points X and Y. A starts from X and B starts from Y. Distance between X and Y is 100 m. A and B starts running towards each other with the speeds of 2 m/s and 3 m/s respectively. Whenever they meet they interchange their speeds. Find the distance from point X when they meet for the fourth time.
(1) 10 m (2) 20 m
(3) 40 m (4) 60 m

2. Navin takes 60 mins to reach Manoj's house. Navin leaves his house for Manoj's house with his dog. The speed of the dog is thrice that of Navin's. The dog reaches Manoj's house and comes back to meet Navin and again runs towards Manoj's house and returns to Navin and so on. When will the dog meet Navin for the third time?
(1) 30 mins (2) 45 mins
(3) 52.5 mins (4) 55 mins

3. A, B and C can finish a job in 30 hours, 50 hours and 75 hours respectively. Each hour any two of them are working. For the first hour C takes rest, in the second hour B takes rest and in the third hour A takes rest and so on. In approximately how much time, would the job be completed ?
(1) 15 hours 16 mins
(2) 21 hours 16 mins
(3) 22 hours 28 mins
(4) 22 hours 16 mins

4. A man is stepping down a downward moving escalator. He takes 10 steps to reach the bottom. As soon as he comes down he realizes that he had left his wallet, so he runs back with 5 times the earlier speed. Now he takes 50 steps to reach the top of the escalator. Find the number of steps on a stationary escalator.
(1) 20 (2) 25
(3) 30 (4) 35

5. Shubham and Madhur are working on alternate days to finish a job. If Shubham starts the work, the job gets completed in 17 days. If Madhur starts the work, the job gets completed in $17\frac{1}{3}$ days. In how many days would the job be completed if Madhur is working alone?
(1) 21.5 (2) 16
(3) 20 (4) 24

6. 4 men took 4 hours to make 4 circular flower beds of radii 4 each. In how many hours would 6 men make 6 flower beds of radii 6 each?
(1) 4 hours (2) 6 hours
(3) 8 hours (4) 9 hours

7. Average of n numbers is A. Each term of the series is first multiplied by 5 and then added to 2. Find the new average of the n numbers.
(1) 5A (2) 5A + 2
(3) $\frac{5A}{2}$ (4) 5(A + 2)

8. Alloy A is made of Lead and Zinc mixed in the ratio of 2 : 3. Alloy B is made of lead and Zinc mixed in the ratio of 4 : 1. Alloys A and B are mixed in the ratio of 2 : 3. 10 kg of this new alloy was replaced by 10 kg of another alloy containing Zinc and Iron in the ratio of 41 : 9. Zinc in the resultant alloy is 66.67%. Find the weight of alloy A.
(1) 6 kg (2) 9 kg
(3) 12 kg (4) 15 kg

9. In a race, A beats B and C by 20 and 15 m respectively. As soon as A finishes the race, B doubles his speed and beats C by 3 m. Find the length of the race track.
(1) 35 m (2) 40 m
(3) 45 m (4) 75 m

10. Time is an integral multiple of minute. In the morning, the minute hand is 2 minute marks ahead of hour hand. What is the time?
_____

11. A boat travelled 3 km downstream and 4 km upstream taking 96 minutes for the entire journey. Find the speed of the boat, if the speed of stream is 0.5 km/hr? _____

12. In a solution, water equal to 28.56% of the volume of a solution of milk and water is added. The new ratio of milk and water becomes 2 : 7. Find the ratio of water to milk in the initial solution.
(1) 2 : 5 (2) 5 : 9
(3) 2 : 9 (4) 5 : 2

13. A is 8.33% less efficient than B. C is 25% more efficient than B. A and B together take 30 days more than A, B and C together to finish a job. Find the number of days required by A, B and C together to finish a job that is twice as big as the former.
(1) 46 (2) 98
(3) 92 (4) 45

14. In a hostel mess there is enough food for 150 students for 80 days. After 14 days, 40 students left for their home on a vacation . 6 days later, 10 students returned back. How long will the remaining food last now ?
(1) 88 days (2) 77 days
(3) 99 days (4) 66 days

15. Five friends dined in a restaurant and all of them paid an integral amount to make the total bill amount. Had all of them paid the same amount it would have been Rs. 17 per person. The median of the amount paid is Rs. 12 and there are two modes. Find the maximum amount that a friend can pay.
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**Directions for questions 16 and 17:** Answer the questions on the basis of the information given below.

John and Dany are running around a circular track in clockwise and anti-clockwise direction, respectively. They start from the same point and at the same time and meet for the first time at a point which is 400 m in the clockwise direction from the starting point. The second meeting takes place at a point which is 600 m from starting point measured in the anti-clockwise direction. John had completed more than a lap when they met the second time.

16. What is the length of the track?
(1) 1400 m (2) 700 m
(3) 1000 m (4) 900 m

17. What is the ratio of speeds of John and Dany?
(1) 3 : 4 (2) 4 : 3
(3) 3 : 7 (4) 4 : 7

18. Rob can build a wall in 5 days, Sansa in 10 days and Arya can break the entire wall in 20 days. They work one at a time in the order Rob, Sansa, Arya. After the second turn of Sansa she had a fight with Rob and from her next turn she also started breaking the wall. In how many days will the wall get built?
(1) 12 days (2) 36 days
(3) 25 days (4) 19 days

19. A and B are running a race of 8.4 km on a circular track of length 700 m. They run in the same direction with speeds in the ratio 2 : 3 respectively. Each time they met B gives A a gold coin. How many gold coins will A have at the end of the race ?
(1) 12 (2) 4
(3) 60 (4) 24

20. A solution contains 52% milk and from this solution one-fourth is replaced with an equal amount of milk. How many times should this process be repeated so that the percentage of milk content is more than 80% ?
(1) 3 (2) 5
(3) 2 (4) 4

21. Two solutions of milk and water with volumes 8L and 10L have $m_1$% and $m_2$% of milk respectively ($m_1 \neq m_2$). If equal portions is taken out from both the solutions and mixed with the other solution, the percentage of milk in both solutions becomes equal. Find the quantity of solution taken out.
(1) 4 L (2) 5 L
(3) 4.44 L (4) 3.33 L

22. A trader sells rice to a customer at a 28.56% profit. To his regular customers he charges at a profit of 8.33%. If his overall profit % is 12.5%, what fraction of his customers are regular customers?
(1) $\frac{27}{35}$ (2) $\frac{27}{34}$
(3) $\frac{27}{32}$ (4) None of these

23. If a man weighing 90 kg joins a group of n people the average weight of the group increases by 2. But if a man weighing 60 kg joins the group the average weight drops by 3. Find n.
(1) 6 (2) 5
(3) 9 (4) 3

24. N is a set of positive integers. It has 24 elements with the smallest as 1 and largest as 25. The average of the elements in this group is $13\frac{5}{12}$. Which positive integer is missing from the given set?

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25. A and B are walking on an escalator moving up, with A in the direction of escalator and B in the opposite direction. For every two steps of A, B takes 3 steps. If A took total 40 steps to reach the top of escalator and B took a total of 60 steps on the escalator, find the total steps on a stationary escalator.
(1) 40 (2) 60
(3) 45 (4) 50

# QA - 2 : Arithmetic – 2
# Answers and Explanations

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 3 | **2** | 3 | **3** | 4 | **4** | 3 | **5** | 1 | **6** | 4 | **7** | 2 | **8** | 1 | **9** | 3 | **10** | 12 |
| **11** | 4.5 | **12** | 4 | **13** | 92 | **14** | 2 | **15** | 59 | **16** | 2 | **17** | 2 | **18** | 3 | **19** | 2 | **20** | 4 |
| **21** | 3 | **22** | 2 | **23** | 2 | **24** | 3 | **25** | 4 | | | | | | | | | | |

1. 3 The condition given in the question is same as both A and B moves backwards after each meeting.
Thus, ratio of speeds 2 : 3 and it would be same as the ratio of distances.
So, distance would be 40 (from X).

2. 3 Ratio of speeds of Navin and the dog is 1 : 3.
So, their 1st meeting would be at 30 min.
Thus, by proportionately, 2nd meeting would be after 15 more minutes and 3rd meeting will take further 7.5 minutes. Thus, total time would be 52.5 minutes.

3. 4 Let the total work be 150 units {LCM (30, 50, 75)}.
A, B and C can do 5, 3 and 2 units/hour respectively.
So, in first three hours, 20 units of work gets completed.
$\Rightarrow$ 140 units of work will be completed in 21 hours.
Now, in 22nd hour A and B will work together and will complete 8 more units, and rest 2 units of work will be completed by A and C together in approximately 16 minutes.
Thus (4) is the correct answer.

4. 3 From question, it is clear that in 1st case, man takes 10 steps and escalators takes N steps (in that interval of time) and reaches bottom. While in second case, man takes 50 steps upwards to compensate the escalators downward speed.
Thus, $50 - (10 + N) = N \Rightarrow N = 20$
So steps in a stationary escalator = 20 + 10 = 30 steps.

5. 1 $S = m + \frac{S}{3}$,
$\Rightarrow \frac{S}{m} = \frac{3}{2}$
where 'S' and 'm' is the one day work of Shubham & Madhur
Now, total work = 9S + 8m, and if Madhur will work alone, it will be completed in
$\left(\frac{9S}{m} + 8\right)$ days $\Rightarrow \left(9 \times \frac{3}{2} + 8\right) \Rightarrow 21.5$ days.

6. 4 $\frac{m_1 d_1 h_1}{w_1} = \frac{m_2 d_2 h_2}{w_2}$ and $w \propto r^2$ (here)
So, $\frac{4 \times 4}{4 \times 4^2} = \frac{6 \times h}{6 \times 6^2} \Rightarrow h = 9$ hours.

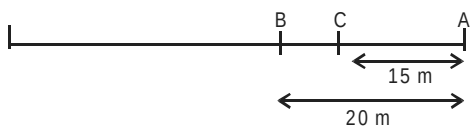
7. 2 Using the properties of averages, answer would be option (2).

8. 1 Part of Zinc in alloy A is three-fifth, while in alloy B it is one-fifth and these two alloys are being mixed in the ratio 2 : 3 i.e. $\frac{3}{5} \times 2x$ and $\frac{1}{5} \times 3x$ part of Zinc from alloy A and alloy B respectively. Further, we are replacing it with 10 kg of new alloy which contains $\frac{41}{50} \times 10$ kg of Zinc, which results in a $\frac{2}{3}$ part of zinc alloy.

Thus $\frac{\left(\frac{2}{5} + \frac{1}{5}\right) \times 3x - \frac{9}{25} \times 10 + \frac{41}{50} \times 10}{5x} = \frac{2}{3}$

From here, we get x = 3
So, 2x = 6.

9. 3 After the increment in B's speed, we can say when B travels 20 m, C travels 12 m. So, without increment B travels 10 m, then C travels 12 metres and the gap between B and C will be increased from 0 to 5m when C will run for 30 metres.
Thus, 30 + 15 = 45 m is the length of the track.




10. After making possible cases on the given condition, we get 4 : 24 is the only time when the given condition is satisfied. (Or in after words, we can say that the minutes must be a multiple of 12. bcoz the movement of our hand will be in the steps of 12 minutes. So will do it by hit and trial).

11. $\frac{3}{n + 0.5} + \frac{4}{n - 0.5} = \frac{96}{60}$
$\Rightarrow n = 4.5$ km/hr

12. 4 For simplicity (or on the basis of given options) we take initial value = 14 units and water = x then milk = (14 – x)

Now, 28.56% is $\frac{2}{7}$ of the value is $\frac{2}{7}\times 14 = 4$ units water is added then in find value milk = (14 – x), and water = (x + 4).

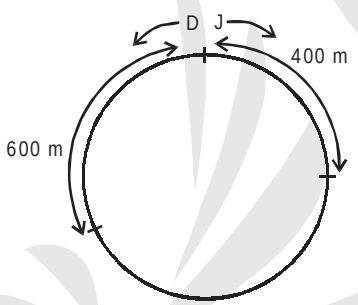
Now, $\frac{14-x}{x+4} = \frac{2}{7} \Rightarrow x = 10$

13. 3 Let say B's efficiency is 12 units per day.
So, A : B : C
Efficiency → 11 : 12 : 15
So, from question, it is clear that in 30 days, A, B and C together do (30 × 23) units of extra work, than only A and B together which in the presence of C, gets completed in $\frac{30\times 23}{15} = 46$ days So, if work is doubled then they'll take 92 days together.

14. 2 150 × 80 = 14 × 150 + 6 × 110 + 120 × n
⇒ n = 77 days

15. $a + a + b + b + c = 85$
→ Increasing order
to maximise C, we'll take a = 1 and b = 12(given)
Thus C = 59

**For questions 16 and 17:** Let x be the length of the track.




$\frac{x+(x-600)}{600} = \frac{400}{x-400}$

Solving we get x = 700
and ratio 4 : 3

16. 2

17. 2

18. 3 Let total work → 20 units, Rob → 4 unit/day, Sarpa → 2 unit/day, Arya → 1 unit/day before fight 10 units of work would have been completed in 6 days. After fight there will be 1 unit work in days till 16 units and last 4 unit would be completed by Rob in one day. Thus a total of 6 + 18 + 1 = 25 days are required.

19. 2 From the given data we can say that a participant can take maximum 14 rounds (options 3 and 4 rejected) and since the ratio of the speeds of A & B is 2 : 3, which means when A will cover 2 circles, B will cover 3 circles which will result their 1st meeting. So, 3 rounds ⇒ 1st meeting, 14 rounds
⇒ 4.67 meetings i.e., 4 meetings.

20. 4 Alligation on milk

52% 100%

x

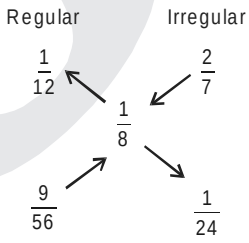
3 : 1

$\frac{100-x}{x-52} = \frac{3}{1} \Rightarrow x = 64$

i.e., in 1st attempt, there is an increase of 12% ⇒ 64%
So, in 2nd attempt, there is an increase of $12 \times \frac{3}{4} = 9\% \Rightarrow 73\%$
So, in 3rd attempt, there is an increase of $12 \times \left(\frac{3}{4}\right)^2 = 6.25\% \Rightarrow 79\%$
∴ 4th attempt will give the desired result.

21. 3 The ratio of milk and water in the extracted mixture should be in the ratio 1 : 3, thus option (1) and (3) are possible.
Now go by options.

22. 2




$\Rightarrow \frac{\text{regular}}{\text{irregular}} = \frac{9}{56}\times\frac{24}{1} = \frac{27}{7}$

So, regular = 27 and total = 34
∴ $\frac{27}{34}$

23. 2 Let say, average of n people is x kg
Then 2n + x + 2 = 90 ⇒ 2n + x = 88 ...(1)
2nd –3x + x – 3 = 60 ⇒ –3n + n = 63 ...(2)
On Solving (1) & (2), we get n = 5

24. $\left(\frac{25+1}{2}\right)\times 25 - \left(13\frac{5}{12}\times 24\right) = 3$

25. 4 It is clear that both are walking for equal time.
Let when A takes 40 steps the escalator takes x steps.
So, from the question.
x + 40 = 60 – x = total number of steps in the escalator.
On Solving, we get x = 10, Thus, there are 40 + 10 = 50 steps on the escalator.