Practice Test-3

Number of questions: 30 **Time Allowed: 30 mins.**

1. Rajesh covers two-thirds of a certain distance at 4 km/hr and the remaining at 5 km/hr. If he takes 42 min in all, what is the total distance covered by him?
   (a) 2.5 km (b) 4 km
   (c) 3 km (d) 4.6 km
2. The spring balance of a trader weighed 800 gm for 1 kg. What is the net result, is it a profit or a loss and by what per cent?
   (a) 25% loss (b) 20% profit
   (c) 20% loss (d) 25% profit
3. If a train 110 m long passes a telegraph pole in 3 s, then the time taken by it to cross a railway platform 165 m long is
   (a) $\frac{110}{3}$ sec (b) 55 sec
   (c) 7.5 sec (d) $\frac{55}{3}$ sec
4. The number 12 is divided into 3 parts which are in A.P. and the sum of their squares is 50. Find the smallest number.
   (a) 5 (b) 3
   (c) 4 (d) 6
5. How long will 20 men take to finish a certain job which 6 men complete in 10 days?
   (a) 3.5 days (b) 3.5 days
   (c) 3 days (d) 5 days
6. Ranjit went to the market carrying Rs. 100 in his purse. If he buys three pens and six pencils he uses up all his money. On the other hand, if he buys three pencils and six pens he would fall short by 20%. If he wants to buy equal number of pens and pencils, how many pencils can he buy?
   (a) 5 (b) 25
   (c) 4 (d) 10
7. A and B are racing on a circular track in the same direction with speeds 20 m/s and 25 m/s respectively. Find the length of the track if they meet 20 sec after they start.
   (a) 100 m (b) 200 m
   (c) 300 m (d) 400 m
8. A vendor sells 30% of his fruit and throws away 40% of the remainder. Next day he sells 50% of the remainder and throws away the rest. What per cent of the fruit does the vendor throw?
   (a) 51% (b) 49%
   (c) 63% (d) 72%
9. An orchard has 48 apple trees, 60 mango trees and 96 banana trees. These have to be arranged in rows such that each row has the same number of trees and of the same type. Find the minimum number of such rows that can be formed.
   (a) 12 (b) 34
   (c) 17 (d) 11
10. The cross section of a canal is trapezium in shape. The canal is 12 m wide at the top and 8 m wide at the bottom. If the area of the cross section is 840 sq. m, find the depth of the canal.
    (a) 42 m (b) 63 m
    (c) 84 m (d) None of these
11. Which parts contain the fractions in ascending order?
    (a) $\frac{11}{14}, \frac{16}{19}, \frac{19}{21}$ (b) $\frac{16}{19}, \frac{11}{14}, \frac{19}{21}$
    (c) $\frac{19}{21}, \frac{11}{14}, \frac{16}{19}$ (d) $\frac{16}{19}, \frac{19}{21}, \frac{11}{14}$
12. S and L are the smallest and the largest n-digit natural numbers respectively. L – S is always divisible by
    (a) 9 (b) 10
    (c) 9 and 10 (d) None of these
13. A train 360 m long is running at a speed of 15 m/sec. Find the time taken by the train to cross a tunnel 390 m long?
    (a) 60 sec (b) 26 sec
    (c) 24 sec (d) 50 sec
14. The difference between the CI and SI on a certain sum of money at 5% per annum for 2 years is Rs. 1.50. Find the sum.
    (a) Rs. 613 (b) Rs. 603
    (c) Rs. 600 (d) Rs. 620

15. If all the sides of a cuboid increase by 20%, then by what percent does its volume increases?
    (a) 20% (b) 44%
    (c) 60% (d) 72.8%
16. Divide Rs. 2,700 into three parts such that 12 times the first is equal to 5 times the second and 6 times the third.
    (a) Rs. 500, Rs. 1,200, Rs. 1,000
    (b) Rs. 500, Rs. 1,500, Rs. 700
    (c) Rs. 900, Rs. 800, Rs. 1,000
    (d) Rs. 1,100, Rs. 1,200, Rs. 400
17. The sum of two numbers is five times their difference. If their product is 24, the numbers are
    (a) 2, 12 (b) 3, 8
    (c) 6, 4 (d) 1, 24
18. Which of the following numbers is exactly divisible by 99?
    (a) 3572403 (b) 913464
    (c) 114345 (d) None of these
19. Arrange the following fractions in descending order
    $\frac{28}{25}, \frac{32}{29}, \frac{8}{11}, \frac{19}{16}$.
    (a) $\frac{28}{25}, \frac{32}{29}, \frac{8}{11}, \frac{41}{44}$
    (b) $\frac{28}{25}, \frac{19}{16}, \frac{32}{29}, \frac{8}{11}$
    (c) $\frac{19}{16}, \frac{32}{29}, \frac{28}{25}, \frac{8}{11}$
    (d) $\frac{19}{16}, \frac{28}{25}, \frac{32}{29}, \frac{8}{11}$
20. 'a' and 'b' are the roots of the equation, $x^2 - x - 3 = 0$. Form the equation whose roots are (3a + 1) and (3b + 1).
    (a) $x^2 - 5x - 23 = 0$
    (b) $x^2 + 5x - 23 = 0$
    (c) $x^2 - (3a + 1)x - (3b + 1) = 0$
    (d) Cannot be determined
21. Gopi gives Rs. 90 as salary to his servant for one year plus one turban. The servant leaves after 9 months and receives Rs. 65 and the turban. Find the price of the turban.
    (a) Rs. 10 (b) Rs. 15
    (c) Rs. 25 (d) Rs. 20
22. Find the greatest number which will divide 12288, 28421, 44333 so as to leave the same remainder in each case.
    (a) 221 (b) 120
    (c) 272 (d) 431
23. In a science course, all students are offered at least one of the subjects, namely mathematics, physics and chemistry. 54 students took mathematics, 51 took physics, 66 took chemistry: 33 took mathematics and physics, 30 took physics and chemistry, 39 took mathematics and chemistry and 24 took all the three subjects. Find how many took only mathematics, how many took only physics and how many took only chemistry?
    (a) 6, 12, 21
    (b) 9, 15, 6
    (c) 15, 24, 6
    (d) None of these
24. Two pipes X and Y can fill a tank in 20 min and 30 min respectively. A third pipe Z can empty the tank in 40 min. Pipes X and Y are kept open initially. After 5 min, pipe Z is also opened. In how much time the tank is full?
    (a) 10 min
    (b) 25 min
    (c) 12 min
    (d) $7\frac{1}{7}$ min
25. A man bought some bananas at the rate of 5 for Rs. 4 and sold all of them at the rate of 4 for Rs. 5. The gain/loss in percentage is.
    (a) 36% gain
    (b) 56.25% gain
    (c) 56.25% loss
    (d) 25% loss.
26. Hari has a piece of cake 60 cm long. He gives Raja half of it. He then gives Gopal $\frac{1}{4}$th of what is left. After giving a piece to Sahil, he is left with $\frac{1}{10}$th of the original. How much did he give to Sahil?
    (a) 21. 5 cm
    (b) 16. 5 cm
    (c) 1.5 cm
    (d) 11. 5 cm

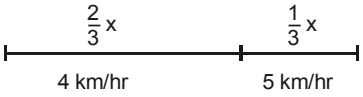
27. Three man rent a pasture for Rs. 660. The first man uses it for 50 sheep for 4 months, the 2nd man for 40 sheep for 3 months and the 3rd man for 46 sheep for 5 months. How much should the 1st man pay?
    (a) Rs. 220 (b) Rs. 235
    (c) Rs. 240 (d) Rs. 276
28. The average income of a person for the first 6 days is Rs. 29, for the next 6 days it is Rs. 24, for the next 10 days it is Rs. 32 and for the remaining days of the month November it is Rs. 30. Find the average income per day:
    (a) Rs. 31.64
    (b) Rs. 30.64
    (c) Rs. 29.26
    (d) Can't be determined
29. A loan was repaid in two annual instalments of Rs. 121 each. If the rate of interest be 10% p.a, compounded annually, the sum borrowed was:
    (a) Rs. 200 (b) Rs. 210
    (c) Rs. 217.80 (d) Rs. 216
30. The distance between two stations A and B is 220 km. A train leaves A towards B at an average speed of 80 km/hr. After half an hour another train leaves B towards A at an average speed of 100 km/hr. Find the distance from A to the point where the two trains meet:
    (a) 180 km
    (b) 120 km
    (c) 160 km
    (d) 80 km

Answer Key

1. (c)	**2.** (d)	**3.** (c)	**4.** (b)	**5.** (c)	**6.** (c)	**7.** (a)	**8.** (b)	**9.** (c)	**10.** (c)
11. (a)	**12.** (d)	**13.** (d)	**14.** (c)	**15.** (d)	**16.** (a)	**17.** (c)	**18.** (c)	**19.** (d)	**20.** (a)
21. (a)	**22.** (a)	**23.** (a)	**24.** (a)	**25.** (b)	**26.** (b)	**27.** (c)	**28.** (c)	**29.** (b)	**30.** (b)

Explanations

1. c Let the total distance covered by Rajesh be x km.



Total time taken by Rajesh to cover x km is 42 min.

Thus, $\frac{42}{60}=\frac{\frac{2}{3}x}{4}+\frac{\frac{1}{3}x}{5}$

$\Rightarrow 42=14x \Rightarrow x=3$ km.

2. d Trader has net profit $=\frac{200}{800}\times 100=25\%$.

3. c Speed of the train while passing through a telegraph pole = $\frac{110}{3}$ m/s.

Now to cross a 165 m long platform time taken by 110 m long train = $\frac{110+165}{110}\times 3$

$=\frac{275}{110}\times 3=2.5\times 3=7.5$ sec

4. b Very easy way is to go through the answer choices , we see that the numbers are 3, 4 and 5 as $3^2 + 4^2 + 5^2 = 50$ and 3 + 4 + 5 = 12

5. c 20 × X = 6 × 10

X = $\frac{6\times 10}{20}$ = 3 days

6. c Let the cost of pen be Rs. x and the cost of pencil be Rs. y.

Then according to the question

3x + 6y = 100 … (i)

6x + 3y = 125 … (ii)

Solving (i) and (ii), we get

$y=\frac{25}{3}$ and $x=\frac{50}{3}$

Let n be the quantity of equal number of pens and pencils.

$\therefore n(x+y)=100 \Rightarrow n=\frac{100\times 3}{75}=4$

7. a Relative speed of B with respect to A = 25 – 20 = 5 m/s. When they meet, B must have taken a lead of exactly one round.

Lead = Relative speed × Time = 5 m/s × 20 s = 100 m

8. b Base 100 (original number of fruits)

Day - I

Sells 30% = 30% of 100 = 30

Throws 40% of 70 = 28

Remainder = 42

Day - II

Sells 50% of 42 = 21

Throws 50% of 42 = 21

Total thrown = 49%.

9. c Since all these trees have to be arranged in rows such that each row has the same number of trees and of the same type. As all the three group of trees are multipes of 12. Thus, the minimum number of such rows where each row consist of 12 trees are 4 + 5 + 8 = 17.

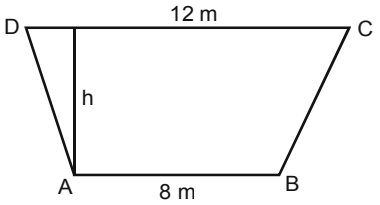
Alternative method:

The HCF of 48, 60 and 96 is 12.

$\therefore$ 12 Trees will be arranged in each row.

Number of rows = $\frac{48+60+96}{12}=17$.

10. c



Let the depth of the canal be h m.

Now area of trapezium = $\frac{1}{2}$h (Sum of parallel sides)

$840=\frac{1}{2}\times h\times(12+8)$

$\Rightarrow h=\frac{840\times 2}{20}=84$ m

11. a Take LCM of 14, 19 and 21 which comes out to be 798 and make the denominator of all the fractions as 798.

Now, the fractions are $\frac{11}{14}=\frac{627}{798}$

Similarly, $\frac{16}{19}=\frac{672}{798}$ and $\frac{19}{21}=\frac{722}{798}$

$\Rightarrow \frac{627}{798}<\frac{672}{798}<\frac{722}{798}$

12. d When n = 1, L – S = 8; when n = 2, L – S = 89, etc. Thus, we see that L – S is never divisible by 9 or 10.

13. d Time taken by 360 m train to cross 390 m long tunnel running with a speed of 15 m/s.

= $\frac{360+390}{15}=\frac{750}{15}=50$ sec

14. c SI = $x \times \frac{5}{100} \times 2 = \frac{10}{100}x$ (where x = sum of money)

Amount = $x\left(1+\frac{r}{100}\right)^n$

CI = $x\left(1+\frac{5}{100}\right)^2 - x = \frac{11025\,x}{10000} - x = \left(\frac{1025}{10000}\right)x$

Difference = $\frac{1025}{10000}x - \frac{10}{100}x = 1.5$

or $\frac{25}{10000}x = 1.5$ or x = Rs. 600

Short cut:

$\Rightarrow$ Difference in interest = $CI_2 - SI_2 = x \times \left(\frac{r}{100}\right)^2$

(Only when difference of CI and SI in 2 years)

Sum $= \frac{1.50 \times 100 \times 100}{5 \times 5}$ = Rs. 600

15. d Suppose initially the sides are x, y and z.

Initial volume = xyz

After the change the sides will be 1.2x, 1.2y and 1.2z.

New volume = 1.728(xyz)

$\therefore$ Increase in volume is 72.8%.

16. a 12A = 5B = 6C = k (Say) $\Rightarrow A = \frac{k}{12}, B = \frac{k}{5}, c = \frac{k}{6}$

Similarly, A : B : C $\Rightarrow \frac{k}{12} : \frac{k}{5} : \frac{k}{6} \Rightarrow 5 : 12 : 10$

A's share = $\frac{5}{27} \times 2700 = \text{Rs. } 500$

B's share = $\frac{12}{27} \times 2700 = \text{Rs. } 1{,}200.$

C's share = Rs. 1,000.

17. c Let the two numbers be x and y.

Then according to the question,

x + y = 5(x – y)

$\Rightarrow$ 4x – 6y = 0

$\Rightarrow x = \frac{3}{2}y$ … (i)

and xy = 24 … (ii)

Using (i) in (ii), we get

$\frac{3}{2}y \cdot y = 24$; $y^2 = 16 \Rightarrow y = 4$

So, x = 6.

18. c The number is divisible by 99, if it is divisible by 9 as well as 11. Using the divisibility rule of 9 and 11, we have found that 114345 is divisible by 99.

19. d Changing the fractions in decimal form, we have found that

$\frac{28}{25} = 1.12$ (approximately)

$\frac{32}{29} = 1.103$ (approximately)

$\frac{8}{11} = 0.72$ (approximately)

$\frac{19}{16} = 1.1875$ (approximately)

Thus the descending order is

$\frac{19}{16} > \frac{28}{25} > \frac{32}{29} > \frac{8}{11}$.

Alternative method:

$\frac{28}{25}, \frac{32}{29}, \frac{8}{11}, \frac{19}{16}$ or $1\frac{3}{25}, 1\frac{3}{29}, \frac{8}{11}, 1\frac{3}{16}$

$\frac{8}{11}$ is the smallest.

Numerator in the other fraction is same.

The number with the smallest denominator will be greatest

$\therefore 1\frac{3}{16} > 1\frac{3}{25} > 1\frac{3}{29} > \frac{8}{11}$ or $\frac{19}{16} > \frac{28}{25} > \frac{32}{29} > \frac{8}{11}$

20. a An equation $x^2 - x - 3 = 0$ has real and distinct roots as we can see discriminant $D = b^2 - 4ac > 0$.

Thus, $x = \frac{1 \pm \sqrt{1+12}}{2} = \frac{1 \pm \sqrt{13}}{2}$

So, the two roots a and b are $a = \frac{1+\sqrt{13}}{2}, b = \frac{1-\sqrt{13}}{2}$

Now 3a + 1 = $\frac{3\left(1+\sqrt{13}\right)}{2} + 1 = \frac{5+3\sqrt{13}}{2}$

and 3b + 1 = $\frac{3\left(1-\sqrt{13}\right)}{2} + 1 = \frac{5-3\sqrt{13}}{2}$

Since 3a + 1 and 3b + 1 are the roots of the equation.

$\therefore$ Sum of the roots = (3a + 1) + (3b + 1)

$= \frac{5+3\sqrt{3}}{2} + \frac{5-3\sqrt{3}}{2} = 5$

and product of the roots = (3a + 1) (3b + 1)

$= \left(\frac{5+3\sqrt{13}}{2}\right)\left(\frac{5-3\sqrt{13}}{2}\right)$

$= \frac{25 - 9 \times 13}{4} = \frac{25-117}{4} = \frac{-92}{4} = -23$

$\therefore$ The equation is $x^2 - 5x - 23 = 0$.

Alternative method:

If a and b are roots $x^2 - x - 3 = 0$

then sum of the roots = a + b = 1 … (i)

and products of the roots = ab = – 3 … (ii)

An equation with roots 3a + 1 and 3b + 1will be

$[x - (3a + 1)]\,[x - (3b + 1)] = 0$

$\Rightarrow x^2 - [3(a + b) + 2] \times + (3a + 1)(3b + 1) = 0$

$\Rightarrow x^2 - [3(a + b) + 2] \times + 9ab + 3(a + b) + 1 = 0$

Putting values of a + b and ab from (i) and (ii),

we get $x^2 - 5x - 23 = 0$

21. a Gopi's servant receives Rs. 90 in a year and a turban.

Thus for one month, he will receive Rs. 7.5.

Thus in 9 months the servant has received

Rs. 7.5 × 9 = Rs. 67.5

But he has given servant Rs. 65 and a turban after 9 months when he had left.

The cost of turban deducted for 3 months = Rs. (67.5 – 65) = Rs. 2.5.

Cost of turban = 2.5 × 4 = Rs. 10

Alternative method:

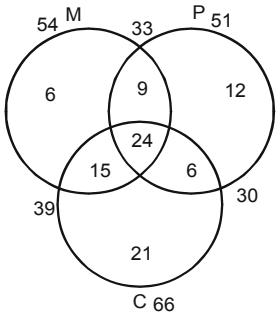
$\left(\frac{90 + T}{12}\right) \times 9 = 65 + T \Rightarrow 270 + 3t = 260 + 4T$

$\Rightarrow T = \text{Rs. } 10$

22. a 28421 – 12288 = 16133

So, divisible number should be odd so two choices are out. Now taking first choice, we get the answer.

23. a



Thus, 6 students have only mathematics, 12 students have only physics, 21 students have only chemistry.

24. a In 1 min two pipes X and Y can fill

$\frac{1}{20} + \frac{1}{30} = \frac{1}{12}$ tank

In 1 min when all the three pipes are active can fill

$\frac{1}{20} + \frac{1}{30} - \frac{1}{40} = \frac{7}{120}$ tank.

In 5 min, two pipes can fill $\frac{5}{12}$ tank.

So, the remaining tank $\frac{7}{12}$ can be filled

$\frac{7}{12} \times \frac{120}{7} = 10 \text{ min.}$

25. b L.C.M of 5 and 4 = 20.

Cost price of 20 bananas $= 20 \times \frac{4}{5} = \text{Rs.}16.$

Selling price of 20 bananas $= 20 \times \frac{5}{4} = \text{Rs.}25.$

Gain $= 25 - 16 = 9$.

Gain percentage $= \frac{9}{16} \times 100 = 56.25\%$ gain.

26. b Total length = 60 cm

Raja's share = 30 cm

Gopal's share = $\frac{30}{4} = 7.5$ cm

Sahil's share= x

Hari's share = 6

$\therefore 30 + \frac{15}{2} + x + 6 = 60$

60 + 15 + 2x + 12 = 120

$\therefore 2x = 33 \Rightarrow x = 16.5$ cm.

27. c The ratio of the share of their expenses

= (50 × 4) : (40 × 3) : (46 × 5)

= 200 : 120 : 230

= 20 : 12 : 23

$\therefore$ Share of the 1st = $\frac{20}{55} \times 660$ = Rs. 240

28. c Total income for the month

(29 × 6 + 24 × 6 + 32 × 10 + 30 × 8) = Rs. 878

$\therefore$ average income per day $= \frac{878}{30} = \text{Rs.}29.26$

29. b Principal = (Present worth of Rs. 121 due 1 year hence) + (Present worth of Rs. 121 due 2 year hence)

$= \frac{121}{\left(1 + \frac{10}{100}\right)} + \frac{121}{\left(1 + \frac{10}{100}\right)^2} = \frac{121}{1.1} + \frac{121}{1.1 \times 1.1}$

= Rs. 210

30. b Distance travelled by the train moving from A in $\frac{1}{2}$ hour = 40 km

Now, the distance of (220 – 40) = 180 km will be covered by a relative speed of (80 + 100) = 180 km/hr.

Hence, time taken in meeting between points A and B = $\frac{180}{180} = 1 \text{ hr}$

Now, distance travelled by the first train in 1 hr = 80 km

Total distance moved by this train before both the train meet = (40 + 80) = 120 km