

# **Mental Maths Competition<sup>®</sup>**

*Organized by*

**Global Maths Science Education<sup>®</sup>**

*In Association with*

**Math Vision Pte Ltd., Singapore.**

**MOCK TEST**

**Std. 9**

## **Instructions for the Competition**

**Total Marks : 200**

**Total No of questions: 75**

1. Time : 1½hr
2. Students can use HB Pencil for marking answers in OMR sheet.
3. Questions are arranged according to 3 difficulty level to provide pupils with optimum exposure to Mental Maths.
4. [Section 1] In this section, there are 40 questions help to build calculation skills. Each question carries 2 marks.
5. [Section 2] It is related with 20 questions to test fundamental concept covered in topic listed below. Each question carries 3 marks.
6. [Section 3] Here questions are challenging & required high order thinking skills. Each question carry 4 marks. Students are requested to practice extra question given alongwith the Mock paper. Any 15 questions can be asked from given question format in mock paper & extra practice questions.

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**SECTION 1**  
**(Mental Maths Calculation)**

1.  $\frac{3}{25} = \underline{\hspace{2cm}}$   
 (a) 0.102 (b) 0.12  
 (c) 0.1012 (d) 0.121
2.  $125 \times 49 \times 8 = \underline{\hspace{2cm}}$   
 (a) 4900 (b) 5000  
 (c) 50000 (d) 49000
3. Average of 35, 37, 39, 41, 43 is  $\underline{\hspace{2cm}}$   
 (a) 37 (b) 41  
 (c) 39 (d) 35
4. The L.C.M. of two number is 18. If one of the number is 6 then the other number is  $\underline{\hspace{2cm}}$   
 (a) 18 (b) 3  
 (c) 2 (d) 7
5.  $1009^2 = \underline{\hspace{2cm}}$   
 (a) 1,081, 081 (b) 1,180,081  
 (c) 1,051,051 (d) 1,018, 081
6.  $996^2 = \underline{\hspace{2cm}}$   
 (a) 992, 016 (b) 982, 016  
 (c) 976, 016 (d) 991, 016
7.  $\sqrt{0.0225} = \underline{\hspace{2cm}}$   
 (a) 15 (b) 1.5  
 (c) 0.15 (d) 0.015
8. The bridge A is 0.486 km and bridge B is 1.28 km long. Find difference between their length.  
 (a) 0.794 (b) 79.4  
 (c) 0.749 (d) 0.793
9.  $\square \% \text{ of } 90 = 63$   
 (a) 30 (b) 40  
 (c) 60 (d) 70
10. How do you write  $\frac{5}{20}$  as percentage.  
 (a) 5% (b) 50%  
 (c) 40% (d) 25%
11. What is a cube of 13  
 (a) 2917 (b) 2297  
 (c) 2197 (d) 2179
12.  $297 + 103 = 40 \times \square$   
 (a) 10 (b) 20  
 (c) 15 (d) 12
13. By what length 50.4 km is longer than  $47\frac{1}{2}$  km  
 (a) 2.8 km (b) 2.9 km  
 (c) 2.7 km (d) 2.6 km
14. Which of these numbers is multiple of 16 & 18 both 48, 126, 90, 144  
 (a) 48 (b) 126  
 (c) 90 (d) 144



15.  $40 \times 2\frac{3}{4} = \square$

- (a) 121 (b) 110  
(c) 50 (d) 111

16.  $7^3 - 7^2 = \square$

- (a) 7 (b) 49  
(c) 680 (d) 294

17. The sum of two integers is - 9. One is 4, find the other.

- (a) 13 (b) - 13  
(c) 5 (d) - 5

18. If  $x = 2$ ,  $y = 3$

$(-x)^y + (y)^x = \square$

- (a) - 1 (b) 2  
(c) 1 (d) - 2

19. Which decimal number is the same as  $\frac{3}{4}$

- (a) 0.34 (b) 0.51  
(c) 0.75 (d) 3.4

20. A man buys a radio for ₹ 600 and sells it at a profit of 25%. He sold the radio for \_\_\_\_\_

- (a) ₹ 700 (b) ₹ 750  
(c) ₹ 900 (d) ₹ 1000

21. The sum of 1.8, 16.3 and 72.985 is

- (a) 91.85 (b) 9108.5  
(c) 91.085 (d) 9.1085

22. 180 km/h = \_\_\_\_\_ m/s

- (a) 10 m/s (b) 50 m/s  
(c) 200 m/s (d) 500 m/s

23.  $(-12) + (-3) \times (4) \times (-6) =$

- (a) - 60 (b) - 360  
(c) 360 (d) 60

24.  $12 : 3 :: x : 1$

Value of x is \_\_\_\_\_

- (a)  $\frac{1}{4}$  (b) 1  
(c) 4 (d) 5

25. When a number is reduced by 4 it becomes 80% of itself. Find the number

- (a) 20 (b) 30  
(c) 40 (d) 50

26. If  $\frac{5}{7}$  of 49 + 20% of 130 = x + 49 then x = \_\_\_\_\_

- (a) 10 (b) 12  
(c) 16 (d) 18

27. Which number is greater than  $\frac{1}{2}$ ?



- (a) 0.7 (b) 0.25  
(c) 0.48 (d) 0.299
28.  $\frac{5}{10} + \frac{3}{1000} = \underline{\hspace{2cm}}$   
(a) 53 (b) 0.53  
(c) 0.530 (d) 0.503
29.  $95 - \square = -400$   
(a) 305 (b) 205  
(c) -205 (d) -305
30. 4 times of 32 – 6 times of 16  
(a) 23 (b) 32  
(c) 48 (d) 0
31.  $\frac{7}{\sqrt{10} + \sqrt{3}} =$   
(a)  $(\sqrt{10} + 3)^2$  (b)  $7(\sqrt{10} - \sqrt{3})$   
(c)  $\sqrt{10} - \sqrt{3}$  (d) None
32. If  $a + b = 7$ ,  $a^2 + b^2 = 25$   
find  $a \times b$   
(a) 12 (b) 13  
(c) 7 (d) 25
33.  $\frac{1}{2}$  of 256 –  $\frac{1}{3}$  of 96 =  
(a) 256 (b) 32  
(c) 96 (d) 54
34. In what times will ₹ 72  
becomes ₹ 81 at  $6\frac{1}{4}\%$  p.a.  
(a)  $1\frac{1}{2}$  years (b)  $2\frac{1}{2}$  years  
(c) 2 years (d) None
35.  $\frac{3}{4}x + 8 = 17$ ,  $x = \square$   
(a) -12 (b) 36  
(c) 12 (d) -36
36. What is a percentage of  
change from 5,00,000 to  
20,000  
(a) 122% increase (b) 122% decrease  
(c) 96% increase (d) 96% decrease
37. A number 40 is divided into  
two parts in the ratio 3:2.  
Find the product of the  
numbers  
(a) 384 (b) 354  
(c) 394 (d) 374
38. 12.5% of 96 =  $4 \times \square$   
(a) 12 (b) 3  
(c) 2 (d) 4
39. Area of square is 625 sq.m.  
Its perimeter is \_\_\_\_\_  
(a) 100 m (b) 125 m  
(c) 50 m (d) 25 m
40. Circumference of circle =  $\pi d$ .  
Find the circumference  
when  $\pi = 3.14$  and  $d = 5\text{cm}$   
(a) 15.8 cm (b) 15.6 cm  
(c) 15.9 cm (d) 15.7 cm

**SECTION 2**  
**(Mental Maths Concepts)**

- 41.** What is a distance travelled in 15 min at 72 km/hr.  
(a) 36 km (b) 18 km  
(c) 30 km (d) 19 km
- 42.** Which of these numbers is equivalent to  $\frac{9}{8}$   
(a)  $\frac{45}{32}$  (b)  $\frac{45}{40}$   
(c)  $\frac{40}{45}$  (d)  $\frac{32}{45}$
- 43.** 20 tins of sweetcorn are bought for ₹ 300 and sold at ₹ 18 per tin. Find profit after selling all the tins.  
(a) 20% (b) 30%  
(c) 40% (d) 10%
- 44.** A boy's walking pace measures 60 cm. How many meter has he walked after taking 50 paces.  
(a) 300 m (b) 30 m  
(c) 3 m (d) 30000 cm
- 45.** An angle is one third of its supplement find its measure  
(a)  $135^\circ$  (b)  $45^\circ$   
(c)  $60^\circ$  (d)  $30^\circ$
- 46.** Half of a number is added to 18 then the sum is 46. The number is   
(a) 92 (b) 56  
(c) 65 (d) 0
- 47.** An article costing ₹ 720 is reduced by  $\frac{1}{20}$  for cash payment price is \_\_\_\_\_  
(a) ₹ 36 (b) ₹ 674  
(c) ₹ 654 (d) ₹ 684
- 48.** The area of hall is  $60\text{m}^2$ . Its length is 8 m find its perimeter  
(a) 15.5 m (b) 14.5 m  
(c) 15 m (d) 14.9 m
- 49.** Ratio of Radii of two circles is 4:9. Their circumference's ratio is \_\_\_\_\_  
(a) 9:4 (b) 4:9  
(c) 8:18 (d) 16:81



50. Two sums of money are in the ratio 2:5, If the second sum is ₹ 95, the first sum is \_\_\_\_\_  
 (a) ₹ 28 (b) ₹ 21  
 (c) ₹ 42 (d) ₹ 38
51. In  $\frac{a}{8} + \frac{a}{4} = 6$ , the value of a is \_\_\_\_\_  
 (a) 122 (b) - 16  
 (c) 16 (d) 0
52. In a  $\Delta ABC$   $AB + BC = 10$  cm  
 $BC + CA = 12$  cm,  $CA + AB = 16$  cm. The perimeter of  $\Delta ABC$  is \_\_\_\_\_  
 (a) 19 cm (b) 17 cm  
 (c) 38 cm (d) none
53. A sum of consecutive odd numbers is 201, find the smallest of them  
 (a) 69 (b) 67  
 (c) 65 (d) 63
54.  $\left(m^{\frac{1}{2}} \times m^{\frac{1}{3}}\right)^6 = m^{\square}$   
 (a) 5 (b) 6  
 (c) 12 (d) 18
55.  $24 - [10 - \{3 - (1 - 4 - 6)\}] =$   
 (a) 26 (b) 24  
 (c) 23 (d) 5
56. Value of X in  $\frac{x}{4} + \frac{1}{2} = 4$   
 (a) 28 (b) - 28  
 (c) 14 (d) - 14
57. In what time a sum will become double of itself at 20% p.a.  
 (a) 10 yrs (b) 4 yrs  
 (c) 5 yrs (d) 20 yrs
58. The three even consecutive integers whose sum is 90. The smallest of them is \_\_\_\_  
 (a) 26 (b) 24  
 (c) 38 (d) 28
59. 5 taps can fill a tank in 8 hrs. How much time will be required for 4 tap to fill the tank.  
 (a) 6 hrs (b) 5 hrs  
 (c) 10 hrs (d) 12 hrs
60. Find the vertex angle of an isosceles triangle if its base angle is  $75^\circ$   
 (a)  $50^\circ$  (b)  $30^\circ$   
 (c)  $25^\circ$  (d)  $115^\circ$



## SECTION 3 (Mental Maths Challenge)

61. A student has to secure 35% marks to pass. He got 80 marks and failed by 60 marks. Find the maximum marks.
- (a) 100                      (b) 200                      (c) 300                      (d) 400
62. ₹ 4800 are distributed among A, B and C in the ratio of 6:5:4; the difference between the shares of A and C is \_\_\_\_\_
- (a) ₹ 450                      (b) ₹ 580                      (c) ₹ 640                      (d) ₹ 1260
63.  $\frac{1}{5}$  of flagpole is black,  $\frac{1}{4}$ th is white and the remaining is painted yellow. Find the length of flag pole.
- (a)  $5\frac{5}{11}$  m                      (b)  $\frac{60}{11}$  cm                      (c) 5 km                      (d) None
64. There were only two candidates who participated in an election. One contestant got 62% votes and was elected by a margin of 144 votes. The total number of votes were \_\_\_\_\_
- (a) 500                      (b) 600                      (c) 700                      (d) 800
65. 4 is added to a number and the sum is multiplied by 5, If 20 is subtracted from the product and the difference is divided by 8, the result is equal to 10. Find the number.
- (a) 16                      (b) 12                      (c) 8                      (d) 20



66. If  $a : b = 3 : 5$  then  $a - b : a + b =$

- (a)  $\frac{-1}{4}$                       (b)  $\frac{1}{4}$                       (c)  $-4$                       (d)  $4$

67. The difference between circumference and radius of a circle is 37 m. The circumference of that circle is \_\_\_\_\_

- (a) 7 m                      (b) 44 m                      (c) 154 m                      (d) none of this

68. The difference between the length and breadth of a rectangle is 23 m. If the perimeter is 206m, then the area is \_\_\_\_\_

- (a)  $1520 \text{ m}^2$                       (b)  $2520 \text{ m}^2$                       (c)  $2420 \text{ m}^2$                       (d) none of this

69. What is the missing term in the following product

$$(2a^3 - 3)(5a^3 - 2) = 10a^6 + \boxed{\phantom{0000}} + 6$$

- (a)  $19a^3$                       (b)  $-19a^3$                       (c)  $16a^3$                       (d)  $-16a^3$

70. Simplify  $\sqrt{300} - \sqrt{48} + \sqrt{75} - \sqrt{147}$

- (a)  $2\sqrt{3}$                       (b)  $\sqrt{3}$                       (c)  $4\sqrt{3}$                       (d) None of this



71. Simplify  $(32)^{\frac{-2}{5}} \div (125)^{\frac{-2}{3}}$

- (a)  $\frac{4}{25}$  (b)  $\frac{25}{4}$  (c)  $\frac{3}{5}$  (d)  $\frac{8}{5}$

72. Simplified value of

$$2\frac{1}{2} + 3\frac{5}{7} \times \frac{3}{13} - \frac{1}{2} \div 4 \text{ is } \boxed{\phantom{000}}$$

- (a)  $\frac{188}{56}$  (b)  $-\frac{181}{56}$  (c)  $-3\frac{13}{56}$  (d)  $3\frac{13}{56}$

73. 20 years ago, when my parents got married, their average age was 23 years, now the average age of my family consisting of my parent & me only is 35 years. My present age is \_\_\_\_\_

- (a) 17 years (b) 19 years (c) 18 years (d) 16 years

74. A number of apples are distributed among A, B and C in the ratio 5:7:8. If A gets 45 apples, then total number of apples is

- (a) 180 (b) 300 (c) 200 (d) none of this

75. A person travelled  $\frac{5}{8}$ th of the distance by train,  $\frac{1}{4}$  th by bus and remaining 15 km by boat. The total distance travelled by him was \_\_\_\_\_ km.

- (a) 90 km (b) 120 km (c) 150 km (d) 180 km

**(Extra Practise Question)**

1. A fort has enough food for 720 soldiers for 35 days. If after 5 days 120 soldiers left the fort, how long will the food last now?  
(a) 36 days      (b) 42 days      (c) 44 days      (d) 32 days
  
2. A big pipe can fill an aquarium in  $\frac{1}{2}$  hr. A small pipe takes  $1\frac{3}{4}$  hr to fill the same aquarium. How long will both pipe take to fill the aquarium together.  
(a) 25 min      (b)  $\frac{1}{2}$  hrs      (c)  $23\frac{1}{3}$  min      (d) 40 min
  
3. When 15 is added to  $2\frac{1}{3}$  of a number, the answer is 4 times the number. Find the number.  
(a) 7      (b) 8      (c) 9      (d) 10
  
4. Numbers 60, 50, 42, 35,  $5x + 10$ ,  $2x - 8$ , 12, 11, 8, 6 are written in descending order and if their median is 25, then x equal to \_\_\_\_\_.  
(a) 10      (b) 12      (c) 14      (d) 16
  
5. If  $A:B = 2:3$ ,  $B:C = 2:1$  and  $C:D = 2:5$  the  $A:D$  equal to \_\_\_\_\_.  
(a) 2:15      (b) 2:5      (c) 1:5      (d) 8:15

6. The largest box of shoes contains 459 pieces. The next size box contains 153 pieces. They also sell a box with 51 pieces and one smallest box. Based on this pattern, how many pieces are there in the smallest box?  
(a) 15 (b) 37 (c) 27 (d) 17
7. A man borrows ₹ 1000 and agrees to repay with a total interest of ₹ 140 in 12 installments. Each installment being less than the preceding by ₹ 10. What should be his first installment?  
(a) ₹ 120 (b) ₹ 140 (c) ₹ 150 (d) ₹ 180
8. 50 circular plates each of radius 7 cm and thickness  $\frac{1}{2}$  cm are placed one above another to form a right circular cylinder. Find total surface area of the cylinder so formed?  
(a)  $1230 \text{ cm}^3$  (b)  $1332 \text{ cm}^2$  (c)  $1408 \text{ cm}^2$  (d)  $1560 \text{ cm}^3$
9. What should come in place of the question marks in the following number series.  
6, 7, 16, 51, 208, , 6276  
(a) 1045 (b) 941 (c) 836 (d) 1254
10. In a soccer tournament the average of 8 goals scored in first 5 games was 6.4. The average of his next four games was 6.5. If there were 9 goals scored in the tenth game. What was the overall average?  
(a) 7.6 (b) 6.7 (c) 9.2 (d) 4.8



11. If a tyre rotates at 150 revolutions/ min when the truck is travelling at 40 km/hr. What is the circumference of tyre?  
(a) 0.0044 km (b) 0.5 km (c) 3.44 km (d) 0.66 km
12. If the numerator of a fraction is increased by 200% and the denominator of the fraction is increased by 150%, the resultant fraction is  $\frac{9}{35}$ .  
(a)  $\frac{3}{10}$  (b)  $\frac{2}{5}$  (c)  $\frac{3}{14}$  (d)  $\frac{2}{17}$
13. In a series 2, 5, 8, 11, ..... what will be 15<sup>th</sup> term.  
(a) 41 (b) 42 (c) 43 (d) 44
14. Mania and Sania graduated from university together. Sania has earned half what Mania earned for 5 years. Mania spent  $\frac{1}{3}$  of money, Sania spent  $\frac{1}{4}$  every for those 5 years. Sania has ₹ 90000 after 5 years.  
(a) ₹ 2,40,000 (b) ₹ 16,000 (c) ₹ 215000 (d) ₹ 1,60,000
15. Five glasses of juice be extracted from half a watermelon. If two glasses can hold 400 ml of juice, how many watermelons are needed to make eight liters of juice?  
(a) 10 (b) 8 (c) 4 (d) 40



16. Three times a number is 225 more than 50% of the same number. What is this number.  
(a) 337.5 (b) 150 (c) 90 (d) 45.5
17. There are 5900 people in a town at the beginning of 2003, Each year, there is 15% increases in the population as new babies are born. At the same times  $\frac{1}{20}$  of the population passes away each year.  
(a) 7080 (b) 6785 (c) 6000 (d) 7139
18. On a farm, there are 40% as many ducks a goats and twice as many cows as ducks. If all the animals have a total of 400 legs, how many ducks ar there on the farm?  
(a) 20 (b) 30 (c) 40 (d) 50
19. Ben, Bala and Jack took part in a race. They drove at speeds of 96 km/hr 1.5 km/min and 1650 m/min. How much faster was the speed of the winner than the person who came third, in km/hr.  
(a) 3 km/h (b) 6 km/hr (c) 9 km/h (d) 12 km/hr
20. The sum of two numbers is  $2x$ . If one number is  $\frac{2}{3}$  of the other. Find the value of bigger number.  
(a)  $\frac{2x}{3}$  (b)  $\frac{x}{6}$  (c)  $\frac{6x}{5}$  (d)  $\frac{5x}{6}$



21. The value of a numerator is 9 less than its denominator. When 5.5 is subtracted from its denominator, the value of fraction becomes  $\frac{2}{3}$ . What is a original fraction.
- (a)  $\frac{16}{7}$                       (b)  $\frac{9}{16}$                       (c)  $\frac{4}{16}$                       (d)  $\frac{7}{16}$
22. 840 people attended Global International Maths Competition. 75% of them were students. 70% were Europeans students. The ratio of number of Indian student to the number of chinese students was 1:2 how many chinese students were there.
- (a) 441                      (b) 189                      (c) 126                      (d) 130
23. Mr. Prabhu travels 390 km in 6 hrs. How long will he take to travel 0.65 km.
- (a) 3.6 seconds    (b) 36 seconds    (c) 3.6 minutes    (d) 36 minutes
24. A square has an area of 8100 cm<sup>2</sup>. If a triangle of base 0.24 m and height 0.34m is cut from it, find the area of remaining square.
- (a) 6792 cm<sup>2</sup>    (b) 6972cm<sup>2</sup>    (c) 7296cm<sup>2</sup>    (d) 7692cm<sup>2</sup>
25. A tin of oil has a mass of 4 kg when it  $\frac{3}{4}$  full. It has a mass of 3.25 kg. When it is  $\frac{3}{5}$  full. Find the mass of the tin.
- (a) 500 gram    (b) 250 gram    (c) 50 gram    (d) 5 kg



### Answer Sheet

1	b		26	b		51	c
2	d		27	a		52	a
3	c		28	d		53	c
4	a		29	d		54	a
5	d		30	b		55	a
6	a		31	c		56	c
7	c		32	a		57	c
8	a		33	c		58	d
9	d		34	c		59	c
10	d		35	c		60	c
11	c		36	d		61	d
12	a		37	a		62	c
13	b		38	b		63	a
14	d		39	a		64	b
15	b		40	d		65	a
16	d		41	b		66	a
17	b		42	b		67	b
18	c		43	a		68	b
19	c		44	b		69	b
20	b		45	b		70	c
21	c		46	b		71	b
22	b		47	d		72	d
23	d		48	a		73	b
24	c		49	d		74	a
25	a		50	d		75	b

### Answers for extra practice questions

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

**Section 3 (Solution)**

61.  $\frac{35}{100}x = 80 + 60$

$$x = 140 \times \frac{100}{35}$$

$$x = 400$$

62. Let  $A = 6x$   $B = 5x$   $C = 4x$

$$15x = 4800, \quad x = 320$$

$$A - C = 6x - 4x$$

$$= 2x$$

$$= 2(320) = 640$$

63. Let length of the flagpole =  $x$

$$x - \left( \frac{x}{5} + \frac{x}{4} \right) = 3$$

$$\therefore \frac{11x}{20} = 3 \quad \therefore x = 5 \frac{5}{11} \text{ units}$$

64. Elected candidate got  $\frac{62x}{100}$  votes

other candidate got  $\frac{38x}{100}$  votes.

$$\therefore \frac{62x - 38x}{100} = 144$$

$$\therefore x = 600$$

65. Let the number be  $x$

$$\therefore \frac{(x+4) \times 5 - 20}{8} = 10$$

$$\therefore 5x + 20 - 20 = 80$$

$$\therefore x = 16$$

66. Let  $a = 3x$ ,  $b = 5x$

$$\therefore \frac{a-b}{a+b} = \frac{3x-5x}{3x+5x} = \frac{-2x}{8x} = -\frac{1}{4}$$

67.  $2\pi r - r = 37$

$$\therefore r(2\pi - 1) = 37$$

$$r = \frac{37}{2\pi - 1}$$

$$= \frac{37}{2 \times \frac{22}{7} - 1} = \frac{37}{\frac{44}{7} - 1} = 37 \times \frac{7}{37} = 7\text{m}$$

$$\therefore C = 2\pi r$$

$$= 2 \times \frac{22}{7} \times 7 = 44\text{ m}$$

68. Let  $b = x$  metre  $\therefore l = x + 23$

$$\therefore \frac{\text{Perimeter}}{2} = l + b \quad \therefore \frac{206}{2} = x + x + 23$$

$$\therefore 103 = 2x + 23$$

$$\therefore x = 40$$

$$\text{Length} = 40, \text{ breadth} = 63, \text{ Area} = 2520 \text{ sqm}$$

69.  $(2a^3 - 3)(5a^3 - 2)$

$$= 10a^6 - 4a^3 - 15a^3 + 6$$

$$= 10a^6 - 19a^3 + 6$$

70.  $\sqrt{300} - \sqrt{48} + \sqrt{75} - \sqrt{149}$

$$= \sqrt{100 \times 3} - \sqrt{16 \times 3} + \sqrt{25 \times 3} - \sqrt{49 \times 3}$$

$$= \sqrt{3} (10 - 4 + 5 - 7)$$

$$= 4\sqrt{3}$$

71.  $(32)^{\frac{-2}{5}} \div (125)^{\frac{-2}{3}}$

$$(2)^{5 \times \frac{-2}{5}} \div (5)^{3 \times \frac{-2}{3}}$$

$$2^{-2} \div 5^{-2} = \left(\frac{2}{5}\right)^{-2} = \left(\frac{5}{2}\right)^2 = \frac{25}{4}$$

72.  $2\frac{1}{2} + 3\frac{5}{7} \times \frac{3}{13} - \frac{1}{2} \div 4$

$$= \frac{5}{2} + \frac{26}{7} \times \frac{3}{13} - \frac{1}{2} \times \frac{1}{4}$$

$$= \frac{5}{2} + \frac{6}{7} - \frac{1}{8} = \frac{140 + 96 - 14}{56} = \frac{222}{56}$$

73. Sum of the age of parent 20 years back =

$$23 \times 2 = 46$$

$$\text{Sum of one present age of My parent}$$



$$= 46 + 20 + 20$$

$$= 86 \text{ yrs}$$

Let my present age be  $x$

$$\therefore \text{Average Presentage} = \frac{86 + x}{3}$$

$$35 \times 3 = 86 + x$$

$$\therefore x = 105 - 86$$

$$x = 19 \text{ yrs}$$

74. let  $A = 5x$ ,  $B = 7x$ ,  $C = 8x$

$$5x = 45 \quad \therefore x = 9$$

$$\begin{aligned} \therefore 5x + 7x + 8x &= 20x \\ &= 20(9) \\ &= 180 \end{aligned}$$

75. Let total distance be  $x$  km

$$\therefore x - \left( \frac{5x}{8} + \frac{x}{4} \right) = 15$$

$$\therefore x - \frac{7x}{8} = 15$$

$$\therefore x = 120 \text{ km}$$

### Extra Practice Questions (Solution)

1. Soliders                      Days

$$720 \quad 30$$

$$600 \quad x$$

Inverse variation

$$600 \times x = 720 \times 30$$

$$x = \frac{720 \times 30}{600} = 36 \text{ days}$$

2. Tank filled by big pipe in 1 hr =  $\frac{1}{1/2} = 2$

$$\text{Tank filled by small pipe in 1 hr} = \frac{1}{7/4} = \frac{4}{7}$$

$$\text{Tank filled by both pipes together} = 2 + \frac{4}{7} = \frac{18}{7}$$

$$\text{Time required by both pipes} = \frac{1}{18/7} = \frac{7}{18} \text{ hr}$$

$$= \frac{7}{18} \times 60 = 23 \frac{1}{3}$$

3. Let the number be  $x$

$$\frac{7}{3}x + 15 = 4x$$

$$4x - \frac{7x}{3} = 15$$

$$5x = 45$$

$$x = 9$$

4.  $\frac{2x + 10 + 2x - 8}{2} = 25$

$$4x + 2 = 50$$

$$4x = 48$$

$$x = 12$$

5.  $A : B = 2:3$  (× 2)

$A : C = 4:3$  (× 2)

$B : C = 2:1$  (× 3)

$C : D = 2:5$  (× 3)

$A : B = 4:6$

$\therefore A : C = 8:6$

$B : C = 6:3$

$\therefore C : D = 6:15$

$\therefore A : C = 4:3$

$\therefore A : D = 8:15$

6.  $459 = 17 \times 3^3$

$$153 = 17 \times 3^2$$

$$51 = 17 \times 3^1$$

$\therefore$  Smallest box will contain  $= 17 \times 3^0 = 17 \times 1 = 17$

shoes

7.  $P = 1000$ , Interest = 140  $A = 1000 + 140 = 1140$

let the first installment be  $x$ .

$$\therefore x + x - 10 + x - 20 + x - 30 + \dots + x - 110 = 1140$$

$$(x + x + \dots 12 \text{ times}) - (10 + 20 + 30 + \dots + 110) = 1140$$

$$12x - 660 = 1140$$



$$12x = 1140 + 660$$

$$12x = 1800$$

$$x = \frac{1800}{12} = 150$$

8.  $r = 7$  cm, height of cylinder  $= 50 \times \frac{1}{2} = 25$  cm

$$\text{T.S.A. of cylinder} = 2 \pi r (r + h)$$

$$= 2 \times \frac{22}{7} \times 7 (7 + 25)$$

$$= 44 \times 32$$

$$= 1408 \text{ cm}^2$$

9.  $6 \times 1 + 1 = 7$ ,  $7 \times 2 + 2 = 16$ ,  $16 \times 3 + 3 = 51$

$$51 \times 4 + 4 = 208$$

$$\therefore 208 \times 5 + 5 = 1045$$

10.  $\frac{(6.4 \times 5) + (6.5 \times 4) + 9}{10} = \frac{67}{10} = 6.7$

11. No. of revolutions in 1 hr  $= 150 \times 60 = 9000$

$$\text{distance travelled in 1 hr} = 40 \text{ km} = 40000 \text{ m}$$

$$\text{distance travelled in 1 revolution} = \frac{40}{9}$$

$$\therefore \text{circumference} = \frac{40}{9} \text{ m} = 4.44 \text{ km}$$

$$\frac{4.44}{1000} = 0.0044 \text{ km} = 0.0044 \text{ km}$$

12. let the original fraction be  $\frac{x}{y}$

$$\frac{x + \frac{200}{100} \times x}{y + \frac{150}{100} \times y} = \frac{9}{35}$$

$$\frac{x + 2x}{y + 1.5y} = \frac{9}{35}$$

$$\frac{3x}{2.5y} = \frac{9}{35}$$

$$\frac{x}{y} = \frac{9}{35} \times \frac{2.5}{3}$$

$$\frac{x}{y} = \frac{9}{35} \times \frac{25}{30}$$

$$\frac{x}{y} = \frac{3}{14}$$

13. To get 4<sup>th</sup> term apply  $3n - 1$

$$\therefore 15^{\text{th}} \text{ term } n = 15$$

$$\therefore 3(15) - 1 = 45 - 1 = 44$$

14. Let Sania earn `  $x$  every year

$$\therefore \text{She spend } \left( \frac{1}{4} \times x \right)$$

$$\text{She Saves } \left( \frac{3}{4} \times x \right)$$

$$\therefore \text{In 5 years she saved } 5 = 90000$$

$$\therefore x = 24000$$

$$\text{Mania earns} = 24000 \times 2 = 48000 \text{ per month}$$

$$\text{in 5 years Mania earn} = 5 \times 48000 = 2,40,000$$

$$\text{Spent by Maria} = \frac{1}{3} \times 24000 = 80000$$

$$\text{Remaining amount} = 1,60,000$$

15. 8 l = 8000 ml

$$1 \text{ glass} = 200 \text{ ml}$$

$$8000 \text{ ml of juice can fill} = 40 \text{ glasses.}$$

$$\text{Glasses Watermelon}$$

$$5 \quad \frac{1}{2}$$

$$40 \quad ?$$

$$\text{No of watermelons} = 40 \times \frac{1}{2} \div 5$$

$$\text{Ans} = 4$$

16. Let the no. be  $x$

$$3x - 0.5 x = 225$$

$$2.5 x = 225$$

$$\therefore x = \frac{225 \times 10}{25} = 90$$



17. Increase = 15% decrease =  $\frac{1}{2} \times 100 = 5\%$

Actual population increase =  $(15 - 5)\% = 10\%$

$\therefore$  Population in the beginning of year 2004

=  $5900 + 590 = 6490$

$\therefore$  Population in the beginning of year 2005

=  $6490 + 649 = 7139$

18. Let No. of Goat = x

No of ducks =  $\frac{40}{100} \times x = \frac{2}{5}x$

No of cows =  $2 \times \frac{2x}{5} = \frac{4x}{5}$

Total no. of legs =  $4(x) + 2\left(\frac{2x}{5}\right) + 4\left(\frac{4x}{5}\right)$

$400 = \frac{4x + 4x + 16x}{5}$

$400 = \frac{40x}{5}$

$\therefore x = 50$

$\therefore$  No. of duck = 20

19. Ben's speed = 96 km/hr

Balia's speed =  $(1.5 \times 60)$  km/hr

Jack's speed =  $(1.650 \times 60)$  km/hr

= 99 km/hr

$\therefore$  The difference =  $99 - 90 = 9$  km/hr

20.  $y + \frac{2}{3}y = 2x$

$\frac{5y}{3} = 2x$

$y = 2x \times \frac{3}{5}$

$y = \frac{6x}{5}$

21. Let original fraction be  $\frac{x-9}{x}$ .

$\frac{x-9}{x-5.5} = \frac{2}{3}$

$2x = 32$

$\frac{2x-18}{2x-11} = \frac{2}{3}$

$x = 16$

$6x - 54 = 4x - 22 \therefore$  Original fraction is  $\frac{7}{16}$

22. No. of students =  $\frac{75}{100} \times 840 = 630$

No. of European students =  $\frac{70}{100} \times 630 = 441$

Remaining students =  $630 - 441 = 189$

No. Chinese students =  $\frac{2}{3} \times 189 = 126$

23. Speed = 390 = 65 km/hr

0.65 km = 650 m

$= \frac{65 \times 1000}{3600}$  m/s

time =  $\frac{650}{\frac{325}{18}}$

$= \frac{325}{18}$

$= \frac{650 \times 18}{325}$

= 36 second

24. Area of triangle =  $\frac{1}{2} \times 24 \times 34$   
= 408 cm<sup>2</sup>

Remaining area =  $8100 - 408 = 7692$  cm<sup>2</sup>

25. Let weight of tin be x kg  
Let weight of oil tin can accommodate by y kg.

$\frac{3}{4}x + y = 4$

$\frac{3}{5}x + y = 3.25$

$\frac{3x}{20} = 0.75$

$x = \frac{0.75 \times 20}{3}$

$x = 5.$

## **Mental Maths Competition®**

- (1) Q. No. 1 to 50 are based on basic. Calculation questions related to Addition, Subtraction, Multiplication and Division, doubling and halving.
- (2) Student should know multiplication tables from 2 to 30.
- (3) Number pattern. Doubling & Halving.
- (4) Mixed operations (BODMAS), Decimal Fraction, Fractions, time
- (5) L.C.M & H.C.F., divisibility of 2, 3, 4, 5, 6, 8, 9, 10, 11
- (6) Integers (Add, Subtract, Multiply, Divide) Mixed sums
- (7) Find day and date in a given calender year.
- (8) Calculation of percentage, Average, Ratio, simple equation, discount, profit & Loss percentage, speed distance
- (9) Square and Square root from 1 to 50, Cubing a number from 1 to 20 & cuberoots.
- (10) Surds, Identities and expansion
- (11) Area and perimeter of square and rectangle. Angles of a triangle, circumference of a circle.

**Books for  
extra practice  
are available  
for  
std. 1 to 7**

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