



CREST Mental Maths Olympiad (CMMO)

Previous Year Paper

Class 12

Time Allowed: 60 minutes

Maximum Marks: 120

- There are a total of **100 questions** in this booklet comprising **2 sections** namely the **Basique and Avance** consisting of **80 questions (1 mark each) & 20 questions (2 marks each)**, respectively.
- There is **only ONE correct option** to a given question.
- No candidate is allowed to carry any textual material, printed or written, bits of paper, any electronic device, etc. inside the examination hall.
- The use of unfair means may result in the cancellation of the exam. Any such instances may be reported at **+91-98182-94134** or **info@crestolympiads.com**

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

FILL IN THE DETAILS

Candidate Name: _____

Class: _____ Section: _____

CREST ID: _____

Basique (Each Question is 1 Mark)

1. Simplify the expression:

$$(-5 + 72) [3 - (-6)3] + (-11 - 2) (8 - 12).$$

- a. 1125
c. 1459
- b. 1248
d. 1585

2. Simplify:

$$\left(\frac{3}{2} - \frac{2}{5}\right) \div \left(\frac{1}{3} + \frac{3}{4}\right)$$

- a. $3\frac{4}{65}$
c. $2\frac{1}{17}$
- b. $5\frac{7}{65}$
d. $1\frac{1}{65}$

3. What is the value of $7\sqrt{6} \times 5\sqrt{24}$?

- a. 420
c. 360
- b. 240
d. 430

4. An elevator descends into a mine shaft at the rate of 7 m/min. If it starts from 5 m above the ground level. How long will it take to reach 205 m down the earth?

- a. 20 min
c. 40 min
- b. 30 min
d. 50 min

5. Convert the recurring decimals to fractions:

$$0.\dot{8}$$

- a. $\frac{8}{9}$
c. $\frac{3}{9}$
- b. $\frac{2}{9}$
d. $\frac{88}{9}$

6. Convert this recurring fraction to decimal:

$$1\frac{3}{11}$$

- a. 1.272727
c. 1.2727.....
- b. 1.27
d. 1.272

7. What is the range for the following data set:

$$1, 2, 8, 9, 7, 4, 1, 1, 3, 2, 3$$

- a. 8
c. 10
- b. 9
d. 11

8. The runs scored by 9 players of a cricket team are 44, 31, 50, 40, 50, 70, 11, 80 and 56. Find the median score.

- a. 31
c. 44
- b. 40
d. 50

9. Find the mean of the data given below:
10, 5, 13, 4, 9, 12, 11 and 24

- a. 7
c. 11
- b. 9
d. 13

10. If $f(x) = 2x^3 - 3x^2 + 12$, then find $f(2)$.

- a. 13
c. 14
- b. 15
d. 16

11. Factorise:

$$x(x^2 + y^2 - z^2) - z(x^2 + y^2 - z^2)$$

- a. $(x + y + z)(x^2 + y^2 + z^2)$
c. $(x + y)(x^2 + y^2 + z^2)$
- b. $(x - z)(x^2 + y^2 + z^2)$
d. $(x^2 + y^2) + (x^2 + z^2)$

12. Simplify:

$$x^2 - 13x - 42 = (x - 6)(x - 7)$$

- a. $3(2x - 3)(x + 8)$
c. $(2x - 3)(3x + 8)$
- b. $(2x - 3)(x + 4)$
d. $3(x - 3)(x + 8)$

13. For what value of p , the quadratic equation, $x^2 - 4x + p = 0$, will have real and distinct roots?

- a. 5
c. 3
- b. 2
d. 4

14. What are the quadratic equations whose roots are 3 and 4?

- a. $x^2 - 7x + 12 = 0$
c. $x^2 - 6x + 9 = 0$
- b. $x^2 - 3x + 4 = 0$
d. $x^2 - 2x - 8 = 0$

15. For what value of k will the equation $5y^2 - 20y + (k - 1) = 0$ have real and equal roots?

- a. 24
c. 21
- b. 17
d. 19

16. Solve:

$$(7^3 + 20) \times (3^5 \div 3^0)$$

- a. 523
c. 640
- b. 606
d. 680

17. Evaluate:

$$81 \times 9 + 3^2 \times 3$$

- a. 729
c. 783
- b. 756
d. 810

18. Evaluate:

$$(1331 \div 121) + 2^5$$

- a. 43
c. 47
- b. 45
d. 49

19. In a 300 m race, Rex beats Max by 60 m or 15 s. Find Rex speed (in m/s).

- a. 2
c. 5
- b. 3
d. 4

20. A train 300 m long crosses a pole in 15 s. Find the time taken by the train to cross a platform of length 180 m (in seconds).

- a. 22
c. 23
- b. 20
d. 24

21. How many km/h does a man walk who passes through a street 600 m long in 5 minutes?

- a. $\frac{24}{5}$ km/h
c. 22 km/h
- b. $\frac{36}{5}$ km/h
d. $\frac{32}{5}$ km/h

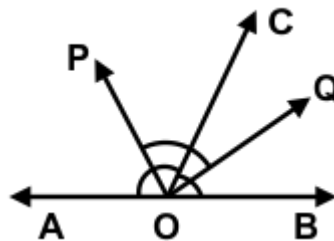
22. How many years will it take for the amount of \$600 to yield \$120 as interest at 10% per annum of simple interest?

- a. 3 years
c. 2 years
- b. 4 years
d. 5 years

23. What is simple interest of \$1800 on 2% per annum for 2 years?

- a. \$72
c. \$64
- b. \$78
d. \$76

32. A man can row at 12 km/hr and downstream at 12 km/hr. Find man's rate in still water.
- a. 8 km/h
b. 10 km/h
c. 9 km/h
d. 12 km/h
33. Nikson spent \$35645 on buying a bike, \$24355 on buying a television and the remaining 20% of the total amount he had as cash with him. What was the total amount?
- a. \$72,360
b. \$78,700
c. \$77,000
d. \$75,000
34. The average age of 30 girls is 13 years. The average of first 18 girls is 15 years. Find out the average age of remaining 12 girls.
- a. 10 years
b. 12 years
c. 14 years
d. 13 years
35. A, B, and C are partners. A receives $\frac{2}{5}$ of the profit and B and C share the remaining profit equally. A's income is increased by \$420 when the profit rises from 8% to 10%. Find the capital invested by B and C together.
- a. \$31250
b. \$31500
c. \$30250
d. \$30500
36. A began a business with \$4500 and was joined afterwards by B with \$3000. When did B join if the profits at the end of the year were divided in the ratio 2 : 1?
- a. 4 months
b. 2 months
c. 7 months
d. 3 months
37. The banker's gain on a bill due 1 year hence at 15% p.a. is \$9. The true discount is:
- a. \$60
b. \$56
c. \$64
d. \$50
38. In the figure, if OP is the bisector of $\angle AOC$ and OQ is the bisector of $\angle BOC$, then find $\angle POQ$.



- a. 65°
b. 75°
c. 80°
d. 90°

68. Which number is divisible by 17?
123445, 133365, 32376, 245346

- a. 32376
b. 123445
c. 133365
d. 245346

69. Which number is divisible by 2 and 8?
23462, 773292, 204120, 956482

- a. 23462
b. 773292
c. 956482
d. 204120

70. Which number is divisible by 14?
57248, 124556, 89534, 484176

- a. 89534
b. 124556
c. 484176
d. 57248

71. Factorise:

$$m - 1 - (m - 1)^2 + ax - a$$

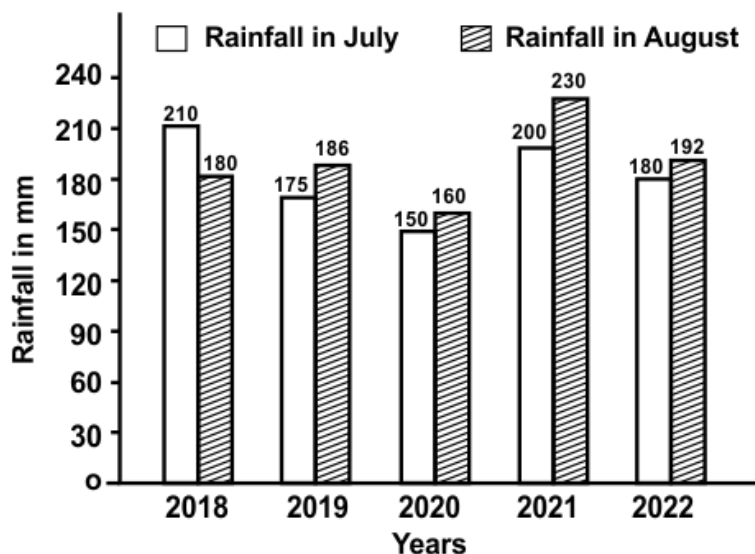
- a. $(2 - x + a)(2x + 1)$
b. $(2 - x + a)(2x - 1)$
c. $(2 - x + a)(x - 1)$
d. $(2 - x + a)(x + 1)$

72. What will come in place of question mark (?) in the following number series?
1, 3, 6, 10, 15, ?

- a. 17
b. 19
c. 21
d. 23

73. Study the bar graph carefully to answer the following question:

Find out the difference between the total rainfall in July 2018 and 2022 together and the total rainfall in August 2019 and 2020 together.



82. Convert the recurring decimals to fractions:

$$2.\overline{917}$$

a. $2\frac{917}{999}$

b. $\frac{219}{999}$

c. $\frac{217}{999}$

d. $1\frac{917}{999}$

83. There are three consecutive positive integers such that sum of the square of the first and product of other two, is 29. What are the integers?

a. 4, 5, 6

b. 3, 4, 5

c. 1, 3, 4

d. 4, 3, 1

84. Factorise:

$$x^4 + x^2y^2 + y^4$$

a. $(x^2 + y^2)^2 - x^2y^2$

b. $(x^2 - y^2)^2 - x^2y^2$

c. $(x^2 - y^2)^2 - xy^2$

d. $(x^2 - y^2)^2 - x^2y$

85. \$600 are invested at 5% simple interest p.a. In how much time will it double itself?

a. 20 years

b. 24 years

c. 22 years

d. 25 years

86. Michael purchased 40 kg of wheat at \$12.50 per kg and 25 kg of wheat at \$15.10 per kg. He mixed the two qualities of wheat for selling. At what rate should it be sold to gain 10%?

a. \$21

b. \$13.63

c. \$34

d. \$14.85

87. A man can row at 24 km/hr in still water. It takes him thrice as long to row up as to row down the river. Find the rate of stream.

a. 14 km/h

b. 23 km/h

c. 12 km/h

d. 18 km/h

88. A and B enter into a partnership with capitals in the ratio 5 : 6. At the end of 8 months, A withdraws his capital. If they receive profits in the ratio of 5 : 9, find how long B's capital was used.

a. 8 months

b. 12 months

c. 10 months

d. 9 months

