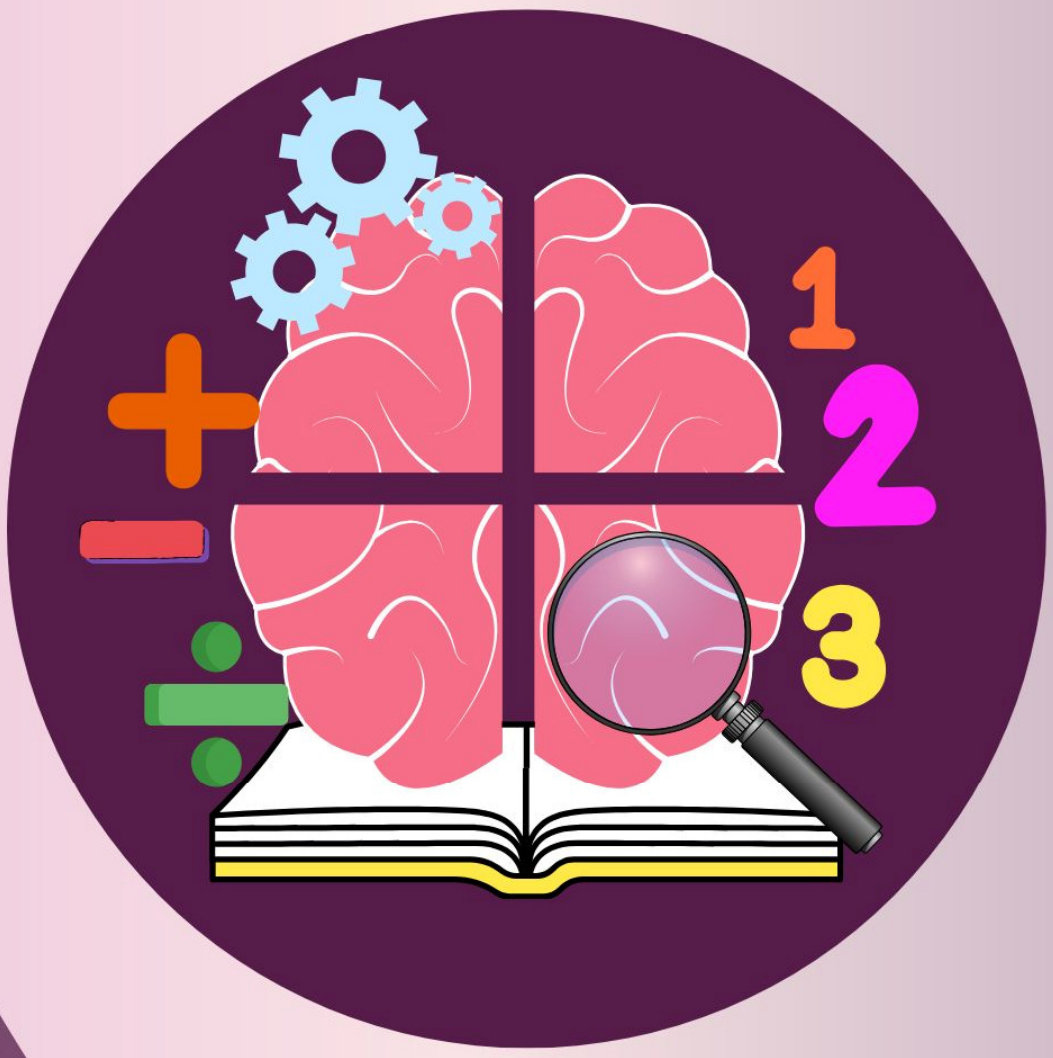
CREST Olympiads

MENTAL MATHS WORKBOOK

6

For the preparation of National & International Competitions



- Chapter-wise practice exercises
- Previous year paper

CREST Mental Maths Olympiad (CMMO)

Mental Maths Competitions

Preparation Book

Grade 6

#CRESTInnovator

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CREST Mental Maths Olympiad (CMMO) Workbook for Grade 6

First Edition

Disclaimer: The information in the Workbook is to give you the path to success but it does not guarantee 100% success as the strategy is completely dependent on its execution.

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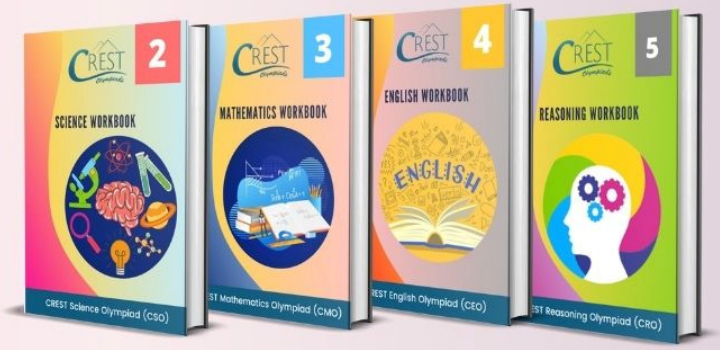

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Preface

We are pleased to launch first edition of this workbook. We welcome feedback from students, teachers, educators and parents. For improvements in the next edition, please send your suggestions at info@crestolympiads.com. Our team will make an effort to work on those suggestions.

CREST Olympiads is one of the largest Olympiad Exams with students from more than 60 countries. The objective of these exams is to build a competitive spirit while evaluating students on conceptual understanding of the concepts.

We strive to provide a superior learning experience, and this workbook is designed to complement the school studies and prepare the students for various competitive exams including the CREST Olympiads. This workbook provides practice questions on the topics. These questions encourage the students to think analytically, to be creative and to come up with solutions of their own. There is a previous year's paper given at the end of this workbook for the students to attempt after completing the syllabus. This paper should be attempted in 1 hour to get an assessment of the student's preparation for the final exam.

Publishers

Chapter 1

Knowing Our Numbers

1. What is the name of the number 13, 582,761 in the international system?

   a. Thirteen million, five hundred eighty-two thousand, seven hundred sixty-one
   b. Thirteen billion, five hundred eighty-two million, seven hundred sixty-one
   c. One hundred thirty-five million, eight hundred twenty-seven thousand, six hundred eleven
   d. Thirteen million, five hundred eighty-two thousand, seventy-six thousand one

2. Compare: 5.007 ___ 5.07.

   a. < b. >
   c. = d. ≥

3. Which of the following is the correct number name for 2,450,876?

   a. Twenty-four million, five hundred eight thousand, seventy-six
   b. Two million, forty-five thousand, eight hundred seventy-six
   c. Two million, four hundred fifty thousand, eight hundred seventy-six
   d. Two billion, four hundred fifty million, eight hundred seventy-six

4. Which of the following is the largest?

   a. Four million, two hundred fifty thousand
   b. 4,200,000
   c. Four million, two hundred thousand
   d. 42,120,001

5. Which option correctly represents the number 'fifty million, three hundred thousand, twenty-one' in digits?

   a. 50,003,021 b. 50,000,021
   c. 50,300,021 d. 50,030,022

6. If you rearrange the digits of the number 802,913 to form the largest possible number, what will it be?

   a. 983,210 b. 983,120
   c. 982,310 d. 981,320

7. What is the correct number name for 14,725,608?

   a. Fourteen million, seven hundred twenty-five thousand, six hundred eight
   b. Fourteen million, seventy-two thousand, five hundred eight
   c. One hundred forty-seven million, two hundred fifty-six thousand, eight
   d. One million, four hundred seventy-two thousand, five hundred sixty-eight

8. Which number is numerically the smallest?

   a. Nine thousand, one hundred two
   b. Nine thousand, two hundred one
   c. Nine thousand, twelve
   d. Nine thousand, one hundred twenty

9. What is the largest odd number you can form by rearranging the digits of 406,857?

   a. 876,540 b. 857,640
   c. 857,460 d. 876,405

10. Convert 'seven million, two hundred fifty thousand, forty-three' into its numeric form.

a. 7,025,043 b. 7,250,043
c. 7,002,543 d. 7,205,043

11. Which of the following is the correct numeric form for the number name 'thirty-two million, nine hundred'?

a. 32,000,900 b. 32,900,000
c. 3,290,000 d. 32,009,000

12. What is the result when the smallest four-digit number is subtracted from the largest three-digit number?

a. -1 b. 0
c. 100 d. 1

13. If you add the number 'twenty-five thousand, three hundred twenty' to 'seventy-five thousand, six hundred eighty', what do you get?

a. 101,000 b. 100,000
c. 101,500 d. 100,500

14. Which of the following numbers is largest based on comparison of numerical values?

a. Nine thousand, one hundred two
b. Nine thousand, two hundred one
c. Nine thousand, twelve
d. Nine thousand, one hundred twenty

15. What is the sum of the smallest and largest numbers you can make with the digits 5, 3, 8, 1, 7?

a. 101, 110 b. 100, 109
c. 101, 109 d. 101, 209

16. A number is written as "Three hundred and forty-two million, five hundred and sixteen thousand, two hundred and seven". What is the digit in the ten-millionth place?

a. 5 b. 4
c. 3 d. 0

17. If 'A' is the greatest 5-digit number formed using all the digits 0, 1, 2, 3, 4 only once, and 'B' is the smallest 6-digit number formed using all the digits 1, 2, 3, 4, 5, 6 only once, which of the following is true?

a. $A > B$ b. $A < B$
c. $A = B$ d. $A \geq B$

18. If the numbers 7, 4, 9, 2 and 6 are arranged in descending order and then each number is doubled, what is the sum of the resulting numbers?

a. 56 b. 46
c. 36 d. 66

19. What is the result of:
$20 - 15 \times 2 + 56 \div 4$

a. 6 b. -6
c. 4 d. -3

20. Using the digits 3, 5 and 7 only once, how many different 3-digit numbers can be formed?

a. 3 b. 6
c. 12 d. 9

21. How many even numbers can be formed using the digits 1, 2, 3, and 4 only once?

a. 24 b. 6
c. 12 d. 10

22. If the number 'forty-five thousand, three hundred and twelve' is written as 'A', then what is the value of 'A' - 312?

a. 46,000 b. 45,000
c. 45,700 d. 44,000

23. If 'A' represents the smallest 9-digit number and 'B' represents the largest 7-digit number, what is the value of A - B?

a. 9,000,001 b. 80,000,001
c. 90,000,001 d. 99,000,001

24. Which of the following numbers is the greatest?

a. Seventy-eight million, two hundred ninety-one thousand, three hundred forty
b. Seventy-eight million, two hundred nineteen thousand, four hundred thirty
c. Seventy-eight million, two hundred nineteen thousand, three hundred forty
d. Seventy-eight million, one hundred ninety-two thousand, three hundred forty

25. Which option correctly represents the number 'Nine billion, eight million, seventy thousand, five hundred' in digits?

a. 9,008,070,500
b. 9,800,070,005
c. 9,000,800,705
d. 9,000,008,070,500

26. Estimate the product of 199 and 501 by rounding to the nearest hundred.

a. 90,000 b. 100,000
c. 10,000 d. 105,000

27. Calculate and then estimate to the nearest hundred:
638 - 294 + 512 ÷ 8

a. 200 b. 400
c. 300 d. 500

28. Estimate the product of 582 and 997 by rounding to the nearest thousand.

a. 6,000,000 b. 1,000,000
c. 600,000 d. 500,000

29. Round 3,499 to the nearest thousand and add to 250, estimated to the nearest hundred.

a. 3700 b. 4000
c. 3400 d. 3300

30. Estimate the sum by rounding to the nearest thousand: 48,762 + 31,954 + 52,603.

a. 140,000 b. 134,000
c. 150,000 d. 135,000

31. Simplify using BODMAS and then round to the nearest ten thousand:
(157,840 × 2) - 215,600

a. 90,000 b. 100,000
c. 110,000 d. 120,000

32. Estimate the product of 65,432 and 298 by rounding to the nearest hundred.

a. 19,500,000 b. 19,000,000
c. 19,000,500 d. 19,620,000

33. Round to the nearest thousand and then compute the difference: 202,345 - 98,764.

a. 104,000 b. 110,000
c. 103,000 d. 130,000

34. Using BODMAS and rounding to the nearest hundred, solve:
(156,000 - 50,000 ÷ 25) × 3

a. 452,000 b. 462,000
c. 460,000 d. 480,000

35. Estimate the sum of 856,732 and 124,568 by rounding to the nearest ten thousand.

a. 970,000 b. 980,000
c. 990,000 d. 1,000,000

36. Simplify by using BODMAS and then round to the nearest hundred:
(98,765 - 32,498) × 2

a. 132,400 b. 132,700
c. 132,500 d. 132,600

37. A farmer harvests 238,765 apples from his orchard and sells them in batches of 500. Estimate the number of batches by rounding the total apples to the nearest thousand.

a. 470 b. 480
c. 478 d. 460

38. A school orders 125,654 sheets of paper and receives an additional 1,234 bonus sheets. If the school uses approximately 3,200 sheets each month, estimate how many months the paper supply will last by rounding to the nearest thousand.

a. 41 b. 40
c. 44 d. 42

39. A construction firm has a budget of $987,654 and estimates construction costs at $54 per square foot. Round both figures to the nearest thousand and estimate the maximum square footage the budget allows.

a. 19,740 sq. ft. b. 19,700 sq. ft.
c. 19,710 sq. ft. d. 19,760 sq. ft.

40. A baker uses 345,678 grams of flour weekly and buys it in 4,000-gram bags. Round the weekly usage to the nearest thousand and calculate how many bags to order for a month, assuming 4 weeks per month.

a. 280 b. 270
c. 320 d. 346

41. Students collected 56,789 millilitres of water for an experiment and need to evenly distribute it into 237 containers. Round the water amount and the number of containers to estimate how much each will hold.

a. 260 b. 237
c. 230 d. 250

42. A school has 1,234 students and needs to order new uniforms for all of them. If each uniform costs approximately $50, estimate the total cost of the uniforms.

a. $80,000 b. $50,000
c. $70,000 d. $60,000

43. A farmer harvests 8,765 kilograms of apples from his orchard. If apples are sold in boxes of 10 kilograms each, estimate the number of boxes he can fill.

a. 800 boxes b. 1000 boxes
c. 900 boxes d. 1100 boxes

44. A library receives a donation of 124,359 books. If each shelf holds about 120 books, estimate how many shelves are needed by rounding the total books to the nearest thousand.

a. 1030 b. 930
c. 1000 d. 1033

45. A construction company uses 253,786 cubic metres of concrete for various projects each month. If they buy concrete in batches of 500 cubic metres, estimate how many batches they order monthly by rounding the total usage to the nearest thousand.

a. 500 b. 520
c. 510 d. 508

46. A school plans a field trip for 2,987 students and needs buses that can hold 45 students each. Estimate how many buses are required by rounding the number of students to the nearest hundred.

a. 60 b. 66
c. 67 d. 70

47. A manufacturer produces 786,540 gadgets annually. If each packaging box holds about 1,000 gadgets, estimate how many boxes are used per year by rounding the total production to the nearest ten thousand.

a. 790 b. 780
c. 800 d. 770

48. Estimate the sum and then simplify: 78,965 + 21,034 - (3,987 × 2).

a. 90000 b. 92000
c. 91000 d. 93000

49. Estimate by rounding to the nearest hundred and then apply: 3,456 + (2,234 ÷ 2) - 1,123.

a. 3500 b. 3000
c. 3600 d. 4000

50. Simplify by rounding all numbers to the nearest thousand and then solve: (28,495 + 15,505) ÷ 2

a. 24000 b. 22000
c. 23000 d. 20000

51. Simplify by rounding all numbers to the nearest thousand and then solve: 12,356 + 8,644 - (1,234 × 3)

a. 15,000 b. 16,000
c. 17,000 d. 18,000

52. Estimate the result by rounding each number to the nearest hundred in the equation: 5,678 + 4,322 - (3,211 × 2)

a. 3600 b. 3800
c. 3500 d. 4000

53. Simplify and rounding to the nearest ten: 9,876 + (2,345 - 1,234) ÷ 3

a. 10,200 b. 10,250
c. 10,220 d. 10,300

54. Which property is illustrated by the equation: 3 × (4 + 5) = (3 × 4) + (3 × 5)?

a. Associative b. Distributive
c. Commutative d. Additive

55. Which property of multiplication states that the order of factors does not change the product?

a. Associative b. Commutative
c. Additive d. Closure

56. What is the result of (111 × 110) – (110 × 112)?

a. -1 b. -112
c. -110 d. -2

57. Fill in the blank: If x is any whole number, then x(x - 1) is always _____.

a. Divisible by 5
b. Prime number
c. An odd number
d. An even number

58. What is the smallest whole number x for which x × (x + 1) × (x + 2) is divisible by 6?

a. 2 b. 3
c. 1 d. 4

59. The expression (50 × 51) + (50 × 49) can be simplified using which property?

a. Commutative b. Associative
c. Distributive d. Closure

60. A farmer divides his herd of 60 cows among three fields in such a way that each field has an even number of cows. How many cows could he place in each field if he wants the numbers in each field to follow the sequence n, n + 2, n + 4?

a. 16, 18, 26 b. 20, 22, 24
c. 18, 20, 22 d. 17, 19, 24

61. During a book fair, a teacher buys books priced at £15, £17, and £21. She notices that if she buys an equal number of each, the total cost is a whole number without decimals. What is the minimum number of each book she should buy to spend at least £159?

a. 4 of each b. 5 of each
c. 3 of each d. 6 of each

62. A cinema has rows with an increasing number of seats. If the first row has 18 seats and each subsequent row has 2 more seats than the previous one, how many seats are in the 10th row?

a. 38 b. 40
c. 36 d. 42

63. In a tower of blocks, each layer has 4 more blocks than the layer above it. If the top layer has 5 blocks, how many blocks are in a tower with 6 layers?

a. 92 b. 90
c. 85 d. 95

64. A baker uses 250 grams of flour for a small cake and 400 grams for a large cake. If she used a total of 7100 grams of flour to make an equal number of each type of cake, how many small cakes did she bake?

a. 11 b. 12
c. 10 d. 15

65. In a game, players earn points in whole numbers. If the total points earned by three players are 150, and each player scored at least 40 points, what is the maximum possible score of the highest-scoring player?

a. 80 b. 70
c. 90 d. 100

66. A gardener plants trees in rows. Each row contains 15 trees, and there are no trees left over. If the total number of trees is between 100 and 200, what could be the total number of trees?

a. 140 b. 100
c. 160 d. 150

67. What is the product of 2 × 1768 × 50?

a. 88200 b. 188200
c. 176800 d. 167200

68. Calculate 4 × 166 × 25.

a. 16500 b. 16700
c. 16600 d. 16000

69. Evaluate 297 × 17 + 297 × 3.

a. 2970 b. 7128
c. 5940 d. 8910

70. What is 738 × 103?

a. 75800 b. 76234
c. 76014 d. 75996

71. Find the result of 258 × 1008.

a. 260064 b. 259704
c. 260000 d. 261000

72. Calculate 345 × 299.

a. 103150 b. 102955
c. 103000 d. 103155

73. A fruit vendor sells 1240 oranges on one day and doubles the next day. What is the total number of oranges sold?

a. 4720 b. 2480
c. 3720 d. 5480

74. Solve: 18 × 107 + 18 × 3

a. 1986 b. 1980
c. 1880 d. 1998

75. A housing complex built by DLF consists of 25 large buildings and 40 small buildings. Each of the large buildings has 15 floors with four apartments on each floor, and each small building has 9 floors with three apartments on each floor. How many apartments are there in total?

a. 2600 b. 2680
c. 2580 d. 2780

76. A school principal in the US placed orders for 85 chairs and 25 tables with a dealer. Each chair costs $45, and each table costs $120. If the principal has given $1500 to the dealer as an advance, what amount is to be given to the dealer now?

a. $6825 b. $3000
c. $5325 d. $3825

77. A dealer purchased 124 LED sets. If the cost of one set is $465, determine their total cost.

a. $57,860 b. $57,660
c. $58,660 d. $60,660

78. A concert generated $22,500 in revenue from ticket sales. If each ticket cost $50, how many tickets were sold?

a. 550 b. 400
c. 350 d. 450

79. An airline operates flights between two cities. Each plane has 180 seats. If the airline operates 10 flights per day and each seat costs $150, what is the total revenue per day from this route?

a. $150,000 b. $270,000
c. $180,000 d. $300,000

80. Solve: 54279 × 92 + 8 × 54279

a. 6420000 b. 5427500
c. 5427900 d. 5427800

81. A publishing house produces 250 books daily. If each book costs $15 to produce, what is the monthly cost of production assuming they operate 30 days a month?

a. $100,000 b. $112,500
c. $125,000 d. $150,000

82. A clothing store receives 600 pieces of clothing, each costing $25. If they sell each at $40, what is their total profit?

a. $8,000 b. $9,000
c. $18,000 d. $7,000

83. A company has 360 employees and plans to form teams each with an equal number of employees. If each team must have more than 8 employees due to company policy, what is the maximum number of teams that can be formed?

a. 38 b. 41
c. 40 d. 39

84. A school principal placed orders for 85 chairs and 25 tables with a dealer. Each chair costs $180, and each table costs $140. If the principal has given $2500 to the dealer as an advance, what amount is to be given to the dealer now?

a. $12,000 b. $24,000
c. $16,300 d. $48,000

85. A landscaper plants 15 trees per day. If each tree requires 3 m^3 of soil and he works 22 days a month, how many m^3 of soil are used in a month?

a. 900 m^3 b. 1000 m^3
c. 990 m^3 d. 950 m^3

86. A bookstore received an order to supply 320 science and 280 math textbooks to a school. If each textbook costs $8, what is the total cost for the order?

a. $5,600 b. $4,600
c. $4,800 d. $4,400

87. A manufacturer produces 450 gadgets daily. If each gadget sells for $35 and the manufacturer operates 300 days a year, what is the annual revenue?

a. $5,250,000 b. $3,750,000
c. $4,500,000 d. $4,725,000

88. Calculate: 2 × 1980 × 50

a. 16880 b. 19880
c. 17680 d. 198000

89. The sum of the predecessor and successor of a number is 1002. What is the number?

a. 1001 b. 1000
c. 501 d. 502

90. The difference between the twice its successor and the predecessor of a number is 500. What is the number?

a. 499 b. 498
c. 500 d. 497

91. The sum of a number and its successor is equal to half of its predecessor. What is the number?

a. 5 b. -6
c. -1 d. 3

92. If a number is increased by 3 and its successor is 92356, what is the number?

a. 95352 b. 92350
c. 92351 d. 92352

93. The product of two whole numbers is 11250. If one of the numbers is 125, what is the other number?

a. 70 b. 45
c. 80 d. 90

94. The sum of three consecutive whole numbers is 122301. Find the largest number.

a. 40767 b. 40668
c. 40766 d. 40768

95. If a number is tripled and 5 is added, the result is 32561. What is the number?

a. 10652 b. 10850
c. 10752 d. 10852

96. A fruit vendor had a certain number of apples. He sold half plus two. He then had 18 apples left. How many did he start with?

a. 36 b. 40
c. 48 d. 44

97. The product of two consecutive even numbers is 120. What is the smaller of the two numbers?

a. 10 b. 12
c. 16 d. 14

98. The sum of three consecutive odd numbers is 57. What is the middle number?

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

99. If a number is doubled and then 7 is added, the result is 23. What is the original number?

a. 10 b. 6
c. 12 d. 8

100. A student scored an average of 85 on three tests. If the student scored 90 on the first test and 82 on the second, what was the score on the third test?

a. 85 b. 91
c. 83 d. 93