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1 CHAPTER

Number System and HCF & LCM

1. The H.C.F. and L.C.M. of two numebrs are 8 and 48 respectively. If one of the numbers is 24, then the other number is **(SSC CGL 1st Sit. 2010)**

(a) 48 (b) 36 (c) 24 (d) 16

2. The greatest number, which when subtracted from 5834, gives a number exactly divisible by each of 20, 28, 32 and 35, is **(SSC CGL 1st Sit. 2010)**

(a) 1120 (b) 4714 (c) 5200 (d) 5600

3. The ninth term of the sequence 0, 3, 8, 15, 24, 35, ... is **(SSC CGL 1st Sit. 2010)**

(a) 63 (b) 70 (c) 80 (d) 99

4. A number, when divided by 114, leaves remainder 21. If the same number is divided by 19, then the remainder will be **(SSC CGL 1st Sit. 2010)**

(a) 1 (b) 2 (c) 7 (d) 17

5. Two numbers are in the ratio 3 : 4. Their L.C.M. is 84. The greater number is **(SSC CGL 1st Sit. 2010)**

(a) 21 (b) 24 (c) 28 (d) 84

6. The sixth term of the sequence 2, 6, 11, 17, ... is **(SSC CGL 1st Sit. 2010)**

(a) 24 (b) 30 (c) 32 (d) 36

7. A number, when divided by 136, leaves remainder 36. If the same number is divided by 17, the remainder will be **(SSC CGL 2nd Sit. 2010)**

(a) 9 (b) 7 (c) 3 (d) 2

8. A 4–digit number is formed by repeating a 2–digit number such as 1515, 3737, etc. Any number of this form is exactly divisible by **(SSC CGL 2nd Sit. 2010)**

(a) 7 (b) 11 (c) 13 (d) 101

9. The H.C.F. and L.C.M. of two numbers are 12 and 336 respectively. If one of the numbers is 84, the other is **(SSC CGL 2nd Sit. 2010)**

(a) 36 (b) 48 (c) 72 (d) 96

10. The sum of two numbers is 36 and their H.C.F and L.C.M. are 3 and 105 respectively. The sum of the reciprocals of two numbers is **(SSC CGL 2nd Sit. 2010)**

(a) $\frac{2}{35}$ (b) $\frac{3}{25}$ (c) $\frac{4}{35}$ (d) $\frac{2}{25}$

11. If 'n' be any natural number, then by which largest number $(n^3 - n)$ is always divisible ? **(SSC CGL 2nd Sit. 2010)**

(a) 3 (b) 6 (c) 12 (d) 18

12. How many perfect squares lie between 120 and 300 ? **(SSC CGL 2nd Sit. 2010)**

(a) 5 (b) 6 (c) 7 (d) 8

13. The remainder when 3^{21} is divided by 5 is **(SSC CGL 1st Sit. 2011)**

(a) 1 (b) 2 (c) 3 (d) 4

14. The last digit of $(1001)^{2008} + 1002$ is **(SSC CGL 1st Sit. 2011)**

(a) 0 (b) 3 (b) 4 (d) 6

15. If $x * y = (x + 3)^2 (y - 1)$, then the value of 5 * 4 is **(SSC CGL 1st Sit. 2011)**

(a) 192 (b) 182 (c) $\sqrt{2}$ (d) 356

16. The L.C.M. of three different numbers is 120. Which of the following ***cannot*** be their H.C.F.? **(SSC CGL 1st Sit. 2011)**

(a) 8 (b) 12 (c) 24 (d) 35

17. A number when divided by 49 leaves 32 as remainder. This number when divided by 7 will have the remainder as **(SSC CGL 1st Sit. 2011)**

(a) 4 (b) 3 (c) 2 (d) 5

18. The traffic lights at three different road crossings change after 24 seconds, 36 seconds and 54 seconds respectively. If they all change simultaneously at 10 : 15 :00 AM, then at what time will they again change simultaneously? **(SSC CGL 1st Sit. 2011)**

(a) 10 : 16 : 54 AM (b) 10 : 18 : 36 AM
(c) 10 : 17 : 02 AM (d) 10 : 22 : 12 AM

19. The least number, which is to be added to the greatest number of 4 digits so that the sum may be divisible by 345, is **(SSC CGL 2nd Sit. 2011)**

(a) 50 (b) 6 (c) 60 (d) 5

20. If 17^{200} is divided by 18, the remainder is **(SSC CGL 2nd Sit. 2011)**

(a) 1 (b) 2 (c) 16 (d) 17

21. The unit digit in the sum of $(124)^{372} + (124)^{373}$ is **(SSC CGL 2nd Sit. 2011)**

(a) 5 (b) 4
(c) 2 (d) 0

22. If $a * b = a^b$, then the value of 5 * 3 is **(SSC CGL 2nd Sit. 2011)**

(a) 125 (b) 243
(c) 53 (d) 15

23. Which one of the following will completely divide $5^{71} + 5^{72} + 5^{73}$? **(SSC CGL 2nd Sit. 2011)**
(a) 150 (b) 160 (c) 155 (d) 30

24. L.C.M. of two numbers is 120 and their H.C.F. is 10. Which of the following can be the sum of those two numbers? **(SSC CGL 2nd Sit. 2011)**
(a) 140 (b) 80
(c) 60 (d) 70

25. When 'n' is divisible by 5 the remainder is 2. What is the remainder when n^2 is divided by 5? **(SSC CGL 2nd Sit. 2011)**
(a) 2 (b) 3 (c) 1 (d) 4

26. Four runners started running simultaneously from a point on a circular track. They took 200 seconds, 300 seconds, 360 seconds and 450 seconds to complete one round. After how much time they meet at the starting point for the first time? **(SSC CGL 2nd Sit. 2011)**
(a) 1800 seconds (b) 3600 seconds
(c) 2400 seconds (d) 4800 seconds

27. The greatest number that can divide 140, 176, 264 leaving remainders of 4, 6, and 9 respectively is **(SSC Sub. Ins. 2012)**
(a) 85 (b) 34 (c) 17 (d) 2

28. There are 4 terms in an A.P. such that the sum of two means is 110 and product of their extremes is 2125. The 3rd term is **(SSC Sub. Ins. 2012)**
(a) 65 (b) 75 (c) 55 (d) 45

29. The number nearest to 75070 which is divisible by 65, is **(SSC CGL 1st Sit. 2012)**
(a) 75070 (b) 75075
(c) 75010 (d) 75065

30. The least number which when divided by 35, 45, 55 leaves the remainder 18, 28, 38 respectively is **(SSC CGL 1st Sit. 2012)**
(a) 3448 (b) 3482 (c) 2468 (d) 3265

31. A three-digit number 4a3 is added to another three-digit number 984 to give the four digit number 13*b*7 which is divisible by 11. Then the value of $(a + b)$ is: **(SSC CGL 1st Sit. 2012)**
(a) 11 (b) 12 (c) 9 (d) 10

32. The greatest number that will divide 19, 35 and 59 to leave the same remainder in each case is: **(SSC CGL 1st Sit. 2012)**
(a) 9 (b) 6 (c) 7 (d) 8

33. The next term of the series
– 1, 6, 25, 62, 123, 214, _____ is: **(SSC CGL 1st Sit. 2012)**
(a) 345 (b) 143 (c) 341 (d) 343

34. The next term of the series 1, 5 12, 24, 43 is **(SSC CGL 1st Sit. 2012)**
(a) 51 (b) 62 (c) 71 (d) 78

35. The least multiple of 13 which when divided by 4, 5, 6, 7 leaves remainder 3 in each case is **(SSC CGL 2nd Sit. 2012)**
(a) 3780 (b) 3783 (c) 2520 (d) 2522

36. What would be the sum of
$1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + ...$ up to 15th term? **(SSC CGL 2nd Sit. 2012)**
(a) 250 (b) 240 (c) 225 (d) 265

37. The least number which when divided by 48, 64, 90, 120 will leave the remainders 38, 54, 80, 110 respectively, is **(SSC CGL 2nd Sit. 2012)**
(a) 2870 (b) 2860
(c) 2890 (d) 2880

38. If $1^3 + 2^3 + ... + 9^3 = 2025$, then the approx. value of $(0.11)^3 + (0.22)^3 + ... + (0.99)^3$ is **(SSC CGL 2nd Sit. 2012)**
(a) 0.2695 (b) 0.3695
(c) 2.695 (d) 3.695

39. With a two digit prime number, if 18 is added, we get another prime number with digits reversed. How many such numbers are possible? **(SSC CGL 2nd Sit. 2012)**
(a) 2 (b) 3 (c) 0 (d) 1

40. If $x = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $y = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, then the value of $x^3 + y^3$ is: **(SSC Sub. Ins. 2013)**
(a) 950 (b) 730 (c) 650 (d) 970

41. The ratio of two numbers is 3 : 4 and their HCF is 5. Their LCM is: **(SSC Sub. Ins. 2013)**
(a) 10 (b) 60 (c) 15 (d) 12

42. L.C.M. of $\frac{2}{3}, \frac{4}{9}, \frac{5}{6}$ is **(SSC CHSL 2013)**
(a) $\frac{20}{27}$ (b) $\frac{8}{27}$ (c) $\frac{20}{3}$ (d) $\frac{10}{3}$

43. 'a' divides 228 leaving a remainder 18. The biggest two-digit value of 'a' is **(SSC CHSL 2013)**
(a) 30 (b) 70 (c) 21 (d) 35

44. If the sum of the digits of any integer lying between 100 and 1000 is subtracted from the number, the result always is **(SSC CHSL 2013)**
(a) divisible by 5
(b) divisible by 6
(c) divisible by 2
(d) divisible by 9

45. The fifth term of the sequence for which $t_1 = 1$, $t_2 = 2$ and $t_{n+2} = t_n + t_{n+1}$, is **(SSC CGL 1st Sit. 2013)**
(a) 5 (b) 10 (c) 6 (d) 8

46. Product of two co-prime numbers is 117. Then their L.C.M. is **(SSC CGL 2013)**
(a) 13 (b) 39
(c) 117 (d) 9

47. A number x when divided by 289 leaves 18 as the remainder. The same number when divided by 17 leaves y as a remainder. The value of y is **(SSC CGL 2nd Sit. 2013)**
(a) 3 (b) 1 (c) 5 (d) 2

48. The sum of the squares of the digits of the largest prime number in two digits is **(SSC Multi-Tasking 2014)**
(a) 148 (b) 130 (c) 97 (d) 118

49. Find the number lying between 900 and 1000 which when divided by 38 and 57 leaves in each case a remainder 23. **(SSC Multi-Tasking 2014)**
(a) 912 (b) 926
(c) 935 (d) 962

50. The next term of the sequence,
$\left(1+\frac{1}{2}\right), \left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right), \left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right), \_\_$ is **(SSC Sub. Ins. 2014)**
(a) 3 (b) $\left(1+\frac{1}{5}\right)$
(c) 5 (d) $\left(1+\frac{1}{2}\right)\left(1+\frac{1}{5}\right)$

51. Three tankers contain 403 litres, 434 litres, 465 litres of diesel respectively. Then the maximum capacity of a container that can measure the diesel of the three container exact number of times is **(SSC Sub. Ins. 2014)**
(a) 31 litres (b) 62 litres
(c) 41 litres (d) 84 litres

52. The H.C.F. and L.C.M. of two numbers are 44 and 264 respectively. If the first number is divided by 2, the quotient is 44. The other number is **(SSC CHSL 2014)**
(a) 147 (b) 528 (c) 132 (d) 264

53. A teacher wants to arrange his students in an equal number of rows and columns. If there are 1369 students, the number of students in the last row are **(SSC CHSL 2014)**
(a) 37 (b) 33 (c) 63 (d) 47

54. The first term of an Arithmetic Progression is 22 and the last term is –11. If the sum is 66, the number of terms in the sequence are : **(SSC CHSL 2014)**
(a) 10 (b) 12 (c) 9 (d) 8

55. If the product of first fifty positive consecutive integers be divisible by 7^n, where n is an integer, then the largest possible value of n is **(SSC CGL 1st Sit. 2014)**
(a) 7 (b) 8
(c) 10 (d) 5

56. The smallest five digit number which is divisible by 12, 18 and 21 is : **(SSC CHSL 2015)**
(a) 50321 (b) 10224
(c) 30256 (d) 10080

57. If $1^3 + 2^3 + ... + 10^3 - 3025$, then the value of $2^3 + 4^3 + ... + 20^3$ is : **(SSC CHSL 2015)**
(a) 5060 (b) 12100
(c) 24200 (d) 7590

58. The least number that should be added to 2055 so that the sum is exactly divisible by 27 : **(SSC CGL 1st Sit. 2015)**
(a) 24 (b) 27 (c) 31 (d) 28

59. The least number which when divided by 6, 9, 12, 15, 18 leaves the same remainder 2 in each case is: **(SSC CGL 2nd Sit. 2015)**
(a) 178 (b) 182 (c) 176 (d) 180

60. What least value must be assigned to '*' so that the numbers 451*603 is exactly divisible by 9? **(SSC CGL 1st Sit. 2016)**
(a) 7 (b) 8 (c) 5 (d) 9

61. If X and Y are the two digits of the number 347XY such that the number is completely divisible by 80, then what is the value of X + Y? **(SSC CGL 2017)**
(a) 2 (b) 4 (c) 6 (d) 8

62. How many numbers are there from 300 to 650 which are completely divisible by both 5 and 7? **(SSC CGL 2017)**
(a) 8 (b) 9 (c) 10 (d) 12

63. Which value among $\sqrt[3]{5}, \sqrt[4]{6}, \sqrt[6]{12}, \sqrt[12]{276}$ is the largest? **(SSC CGL 2017)**
(a) $\sqrt[3]{5}$ (b) $\sqrt[4]{6}$ (c) $\sqrt[6]{12}$ (d) $\sqrt[12]{276}$

64. By which least number should 5000 be divided so that it becomes a perfect square? **(SSC CGL 2017)**
(a) 2 (b) 5 (c) 10 (d) 25

65. What is the LCM (least common multiple) of 57 and 93? **(SSC CHSL 2017)**
(a) 1767 (b) 1567 (c) 1576 (d) 1919

66. Product of digits of a 2–digit number is 27. If we add 54 to the number, the new number obtained is a number formed by interchange of the digits. Find the number. **(SSC CHSL 2017)**
(a) 39 (b) 93 (c) 63 (d) 36

67. The least number of five digits exactly divisible by 88 is: **(SSC MTS 2017)**
(a) 10088 (b) 10023 (c) 10132 (d) 10032

68. Of the three numbers, the first is twice the second, and the second is twice the third. The average of the reciprocal of the numbers is 7/12. The numbers are: **(SSC MTS 2017)**
(a) 20, 10, 5 (b) 4, 2, 1
(c) 36, 18, 9 (d) 16, 8, 4

69. What is the smallest value that must be added to 709, so that the resultant is a perfect square? **(SSC Sub. Ins. 2017)**
(a) 8 (b) 12
(c) 20 (d) 32

70. Which one among $\sqrt{10}+\sqrt{4}, \sqrt{11}+\sqrt{3}, \sqrt{7}+\sqrt{7}$ is the smallest number? **(SSC Sub. Ins. 2017)**

(a) $\sqrt{10}+\sqrt{4}$ (b) $\sqrt{11}+\sqrt{3}$

(c) $\sqrt{7}+\sqrt{7}$ (d) All are equal

71. If 34N is divisible by 11, then what is the value of N? **(SSC Sub. Ins. 2017)**

(a) 1 (b) 3 (c) 4 (d) 9

72. What is the sum of the digits of the least number, which when divided by 12,16 and 54, leaves the same remainder 7 in each case, and is also completely divisible by 13? **(SSC Sub. Ins. 2018)**

(a) 36 (b) 16 (c) 9 (d) 27

73. If the seven digit number $74x29y6$ is divisible by 72, then what will be the value of $(2x + 3y)$? **(SSC Sub. Ins. 2018)**

(a) 21 (b) 20 (c) 19 (d) 16

74. Two numbers are in the ratio 4 : 7. If their HCF is 26, then the sum of these two numbers will be: **(SSC Sub. Ins. 2018)**

(a) 364 (b) 286 (c) 338 (d) 312

75. The square root of which of the following is a rational number? **(SSC Sub. Ins. 2018)**

(a) 5823.82 (b) 1489.96

(c) 22504.9 (d) 2460.14

76. If $x = \frac{1}{12.13}+\frac{1}{13.14}+\frac{1}{14.15}+\cdots\ldots+\frac{1}{23.24}$

$y = \frac{1}{36.37}+\frac{1}{37.38}+\frac{1}{38.39}+\cdots\ldots+\frac{1}{71.72}$ then $\frac{x}{y}$ is equal to : **(SSC CHSL-2018)**

(a) $\frac{1}{3}$ (b) $\frac{1}{24}$

(c) $\frac{1}{72}$ (d) 3

77. Which among the following numbers is exactly divisible by 11.13 and 7? **(SSC CHSL-2018)**

(a) 259237 (b) 259248

(c) 259270 (d) 259259

78. If the six digit number $15x^1y^2$ is divisible by 44, then $(x + y)$ is equal to: **(SSC CGL-2018)**

(a) 8 (b) 7 (c) 6 (d) 9

79. What is the value of x so that the seven digit number $8439x53$ is divisible by 99? **(SSC CGL-2018)**

(a) 9 (b) 4 (c) 3 (d) 6

80. What is the median of the given data? **(SSC MTS 2018)**
41, 43, 46, 50, 85, 61, 76, 55, 58, 95

(a) 61 (b) 58 (c) 57 (d) 55

81. If A is the smallest three digit number divisible by both 6 and 7 and B is the largest four digit number divisible by both 6 and 7, then what is the value of B – A? **(SSC MTS 2018)**

(a) 9912 (b) 9870

(c) 9996 (d) 9954

82. If the number $1005x4$ is completely divisible by 8, then the smallest integer in place of x will be : **(SSC CGL 2019-20)**

(a) 1 (b) 0

(c) 4 (d) 2

83. What is the HCF of $2^3 \times 3^4$ and $2^5 \times 3^2$? **(SSC MTS 2019-20)**

(a) $2^5 \times 3^3$ (b) $2^3 \times 3^4$

(c) $2^3 \times 3^2$ (d) $2^5 \times 3^4$

84. Table given below shows the number of students having obtained different marks. **(SSC MTS 2019-20)**

Marks	Number of students	Marks	Number of students
9 – 11	6	11 – 13	5
13 – 15	2	15 – 17	2
17 – 19	5		

What is the mean marks per student?

(a) 13.5 (b) 12.25

(c) 15.5 (d) 14.25

85. When $(77^{77} + 77)$ is divided by 78, the remainder is: **(SSC CHSL 2019-20)**

(a) 74 (b) 77 (c) 75 (d) 76

86. Find the greatest value of b so that $30a68b$ $(a > b)$ is divisible by 11. **(SSC CGL 2020-21)**

(a) 4 (b) 6 (c) 3 (d) 9

87. If the nine-digit number '8475639AB' is divisible by 99, then what is the value of A and B? **(SSC CHSL 2020-21)**

(a) A = 4, B = 8 (b) A = 3, B = 9

(c) A = 5, B = 3 (d) A = 4, B = 6

88. Which is the largest number that will divide 2036 and 233 leaving remainders 12 and 13, respectively? **(SSC MTS 2020-21)**

(a) 36 (b) 42 (c) 44 (d) 46

89. In a week, the weights of a bag of tea were 350 kg, 340 kg, 270 kg, 360 kg, 310 kg, 300 kg. The range (in kg) is: **(SSC MTS 2020-21)**

(a) 80 (b) 70 (c) 90 (d) 100®

90. If a nine-digit number $785x3678y$ is divisibie by 72, then the value of $(x – y)$ is: **(SSC Sub-Inspector 2020-21)**

(a) –2 (b) 0 (c) 2 (d) –1

91. Two numbers are in the ratio 7 : 11. If their HCF is 28, then the difference between the two numbers is: **(SSC Sub-Inspector 2020-21)**

(a) 28 (b) 308 (c) 112 (d) 196

92. What is the least number which when divided by 15, 18 and 36 leaves the same remainder 9 in each case and is divisible by 11? **(SSC Sub-Inspector 2020-21)**

(a) 1269 (b) 1071 (c) 1089 (d) 1080

93. If $14331433 \times 1422 \times 1425$ is divided by 12, then what is the remainder ? **(SSC Sub-Inspector 2020-21)**
(a) 3 (b) 6 (c) 9 (d) 8

94. The LCM of two positive integers is twice the larger number and the HCF of the two numbers is 3. The smaller number is: **(SSC MTS 2021-22)**
(a) 6 (b) 10 (c) 9 (d) 8

95. The fourth proportional to the numbers 5, 6 and 8 is: **(SSC CHSL 2021-2022)**
(a) 9.8 (b) 9.6 (c) 9 (d) 9.5

96. Which of the following is divisible by 3? **(SSC CHSL 2021-2022)**
(a) 7345932 (b) 5439763 (c) 3642589 (d) 3262735

97. What is the sum of all two digit even numbers? **(SSC CHSL 2023)**
(a) 2520 (b) 2470 (c) 2430 (d) 2410

98. Find the greatest number 23a68b, which is divisible by 3 but NOT divisible by 9. **(SSC CGL 2021-22)**
(a) 238689 (b) 239685 (c) 239688 (d) 237687

99. LCM of two numbers is 56 times their HCF, with the sum of their HCF and LCM being 1710. If one of the two numbers is 240, then what is the other number? **(SSC CGL 2021-22)**
(a) 57 (b) 171 (c) 1680 (d) 210

100. The HCF of two numbers is 12. Which one of the following can never be their LCM? **(SSC CGL 2022)**
(a) 72 (b) 60 (c) 90 (d) 84

101. If A is a greater than B by 7, B is greater than C by 16, and A + B – C is 255, then the value of 3A + C – 4B is : **(SSC Sub-Inspector 2022)**
(a) 5 (b) 10 (c) 8 (d) 4

102. Which of the following is a prime number? **(SSC Sub-Inspector 2022)**
(a) 54 (b) 39 (c) 68 (d) 89

103. The least common multiple of a and b is 42. The LCM of 5a and 11b is : **(SSC Sub-Inspector 2022)**
(a) 2310 (b) 4620 (c) 210 (d) 462

104. What is the least value of x so that the number 8×5215 becomes divisible by 9? **(SSC Sub-Inspector 2022)**
(a) 3 (b) 1
(c) 5 (d) 6

105. A number, when divided by 15 and 18 every time, leaves 3 as a remainder, the least possible number is: **(SSC Sub-Inspector 2022)**
(a) 83 (b) 103 (c) 39 (d) 93

106. What is the LCM of 15 and 25 ? **(SSC MTS 2022)**
(a) 25 (b) 105
(c) 75 (d) 125

107. What is the HCF of two prime numbers X and Y ? **(SSC MTS 2022)**
(a) 1 (b) 2
(c) Y (d) X

108. The HCF of two numbers is one-twentieth of their LCM. If one of the numbers is 96 and the difference of the LCM and the HCF is 456, then what is the other number? **(SSC CHSL 2022, Tier-II)**
(a) 48 (b) 120
(c) 144 (d) 72

109. The HCF of two numbers is 11 and their LCM is 693. If one of the numbers is 77, find the other. **(SSC CHSL 2022, Tier-II)**
(a) 66 (b) 99 (c) 55 (d) 44

110. What is the correct descending order of the following ratios? $\frac{17}{30}, \frac{7}{15}, \frac{27}{50}, \frac{11}{20}$ **(SSC CHSL 2022, Tier-II)**
(a) 11/20 > 17/30 > 27/50 > 7/15
(b) 17/30 > 11/20 > 27/50 > 7/15
(c) 17/30 > 27/50 > 11/20 > 7/15
(d) 7/15 > 11/20 > 27/50 >17/30

111. How many whole numbers lie between 11^2 and 12^2 ? **(SSC CHSL 2022, Tier-II)**
(a) 23 (b) 24 (c) 21 (d) 22

112. A number is divisible by 3 only when: **(SSC CHSL 2022, Tier-II)**
(a) the difference of the sum of the odd and the even digits is divisible by 3
(b) the sum of its digits is divisible by 3
(c) the last digit is either 0 or an even number
(d) the last two digits are divisible by 3

113. A six-digit number 11p9q4 is divisible by 24. Then the greatest possible value for pq is: **(SSC CGL 2022, Tier-II)**
(a) 42 (b) 32
(c) 56 (d) 68

114. Two persons take steps of 77 cm and 88 cm, respectively. If they start in step, then what is the minimum distance (in cm) they should cover so that both of them can cover the distance in complete steps? **(SSC MTS 2023)**
(a) 968 (b) 828
(c) 616 (d) 560

115. If a right circular cone of height 24 cm has the circumference of its base 42π cm. then the volume of the cone is $(\text{use } \pi = \frac{22}{7})$ **(SSC CHSL 2023, Shift-I)**
(a) 15211 cm^3 (b) 11088 cm^3
(c) 12034 cm^3 (d) 21011 cm^3

116. Which of the following numbers is NOT divisible by 11? **(SSC CHSL 2023, Shift-I)**
(a) 1735624 (b) 752563
(c) 1661308 (d) 1904529

117. Find the LCM of 15, 24, 35 and 54.
(SSC Sub-Inspector 2023)
(a) 5670 (b) 7560
(c) 7650 (d) 6570

118. The largest number of four digits that is exactly divisible by 17 and 36 is: **(SSC Sub-Inspector 2023)**
(a) 7956 (b) 9180
(c) 9792 (d) 8568

119. The HCF and the LCM of two numbers are 5 and 175, respectively. If the ratio of the two numbers is 5 : 7, the larger of the two numbers is _____.
(SSC Sub-Inspector 2023)
(a) 35 (b) 25
(c) 45 (d) 75

120. The product of two numbers is 726 and their HCF is 11, then their LCM is: **(SSC Sub-Inspector 2023)**
(a) 58 (b) 68 (c) 66 (d) 76

121. The radii of the ends of a frustum of a solid right - circular cone 45 cm hight are 28 cm and 7 cm. If this frustum is melted and reconstructed into a solid right circular cylinder whose radius of base and height are in the ratio 3 : 5, find the curved surface area (in cm^2) of this cylinder. [Use $\pi = \frac{22}{7}$.] **(SSC Sub-Inspector 2023)**
(a) 4580 (b) 4610
(c) 4640 (d) 4620

122. Two numbers are in the ratio 3 : 4. The product of their HCF and LCM is 2700. The sum of the numbers is :
(SSC Sub-Inspector 2023)
(a) 60 (b) 105 (c) 15 (d) 45

123. Which number among 34936, 35508, 35580 and 36508 is divisible by 33? **(SSC CGL 2023, Tier-I)**
(a) 35580 (b) 35508
(c) 36508 (d) 34936

124. The LCM of $x^2 - 8x + 15$ and $x^2 - 5x + 6$ is:
(SSC CGL 2023,Tier-II)
(a) $(x-2)(x-3)(x-5)$ (b) $(x-6)^2(x+1)(x-3)$
(c) $(x-6)(x+1)(x-3)$ (d) $(x+6)(x+1)(x-3)$

125. Rewa has some hens and some goates. If the total number of animal heads is 100 and the total number of animal feet is 348, then what is the total number of goats with Rewa?
(SSC CGL 2023,Tier-II)
(a) 76 (b) 74
(c) 55 (d) 80

126. The number 2918245 is divisible by which of the following numbers? **(SSC CGL 2023,Tier-II)**
(a) 3 (b) 11
(c) 12 (d) 9

127. Find the value of given expression.
(SSC CGL 2023,Tier-II)
$[76 - \{90 \div 5 \times (24 - 36 \div 3) \div 3\}]$
(a) 71.5 (b) 75.5
(c) 4 (d) 77.5

HINTS & EXPLANATIONS

1. (d) $p \times q = HCF \times LCM$

$\therefore$ Second number $= \frac{8 \times 48}{24} = 16$

2. (b)

2	20, 28, 32, 35
2	10, 14, 16, 35
5	5, 7, 8, 35
7	1, 7, 8, 7
	1, 1, 8, 1

$\therefore$ LCM $= 2 \times 2 \times 5 \times 7 \times 8 = 1120$

$\therefore$ Required number $= 5834 - 1120 = 4714$

3. (c) $0 + 3 = 3$

$3 + 5 = 8$

$8 + 7 = 15$

$15 + 9 = 24$

$24 + 11 = 35$

$35 + 13 = 48$

$48 + 15 = 63$

$63 + 17 = \boxed{80}$

4. (b) If the first divisor is a multiple of second divisor. Then, remainder by the second divisor.

$\therefore$ Remainder $= 21 \div 19 = 2$

5. (c) Let the numbers be 3x and 4x.

$\therefore$ Their LCM $= 12x$

$\therefore 12x = 84$

$\Rightarrow x = \frac{84}{12} = 7$

$\therefore$ Larger number $= 4x = 4 \times 7 = 28$

6. (c) $2 + 4 = 6$

$6 + 5 = 11$

$11 + 6 = 17$

$17 + 7 = 24$

$24 + 8 = \boxed{32}$

7. (d) If the first divisor be a multiple of the second divisor, then required remainder = remainder obtained by dividing the first remainder (36) by the second divisor (17) = 2

$\because$ 17 is a factor of 136

$\therefore$ Remainder when 36 is divided by 17 = 2

8. (d) $xyxy = xy \times 100 + xy$

$= xy(100 + 1) = 101 \times xy$

Hence, the number is exactly divisible by 101.

9. (b) First number $\times$ second number

= HCF $\times$ LCM

$\Rightarrow 84 \times$ second number $= 12 \times 336$

$\therefore$ Second number

$= \frac{12 \times 336}{84} = 48$

$p \times q = HCF \times LCM$

$q = \frac{12 \times 336}{84} = 48$

10. (c) Let the numbers be 3x and 3y.

$\therefore 3x + 3y = 36$

$\Rightarrow x + y = 12$ ...(i)

and $3xy = 105$ ...(ii)

Dividing equation (i) by (ii), we have

$\frac{x}{3xy} + \frac{y}{3xy} = \frac{12}{105} \Rightarrow \frac{1}{3y} + \frac{1}{3x} = \frac{4}{35}$

Shortcut Method:

$\frac{1}{x} + \frac{1}{y} = \frac{x + y}{xy}$

11. (b) $n^3 - n = (n^2 - 1) \Rightarrow n(n+1)(n-1)$

For $n = 2$, $n^3 - n = 6$

$2^3 - 2 = 6$

i.e. $n^3 - n$ is always divisible by 6.

12. (c) $11^2 = 121$, $12^2 = 144$, $13^2 = 169$, $14^2 = 196$

$15^2 = 225$, $16^2 = 256$, $17^2 = 289$

Square no above 120 = 121 of 11

Square no below 300 = 289 of 17

Total 11, 12, 13, 14, 15, 16, 17, i.e. 7 no.

Alternate Method:

First square number above 120 is 121

$11^2 > 120$ and $18^2 > 300$

Hence, required number of squares between 120 to 300

$= 18 - 11 = 7$

13. (c) $3^1 = 3$; $3^2 = 9$; $3^3 = 27$; $3^5 = 81$; $3^5 = 243$

i.e. unit's digit is repeated after index 4.

Remainder after dividing 21 by 4 = 1

$\therefore$ Unit's digit in the expansion of $(3)^{21} = 3$

$\therefore$ Remainder after dividing by 5 = 3

14. (b) Last digit of $(1001)^{2008} + 1002 = 1 + 2 = 3$

15. (a) $x \bigstar y = (x+3)^2 (y-1)$

$\therefore 5 \bigstar 4 = (5+3)^2 (4-1)$

$= 64 \times 3 = 192$

16. (d) HCF must be a factor of LCM from option 35 is not factor of 120.

OR

Alternate Method:

If two number are in the form of ax and bx then x is H.C.F and $a \times b \times x$ is their L.C.M

Hence L.C.M is always divisible by H.C.F.

17. (a) Here, the first divisor i.e. 49 is multiple of second divisor i.e. 7.
$\therefore$ Required remainder = Remainder obtained on dividing 32 by 7 = 4

18. (b) LCM of 24, 36 and 54 seconds
= 216 seconds = 3 minutes 36 seconds
$\therefore$ Required time = 10 : 15 : 00 +
3 minutes 36 seconds = 10 : 18 : 36 a.m.

19. (b) The largest 4-digit number = 9999

$$\begin{array}{r} 345\overline{)9999}(28 \\ \underline{690} \\ 3099 \\ \underline{2760} \\ 339 \end{array}$$

$\therefore$ Required number = 345 – 339 = 6

20. (a) Remainder when $(x-1)^n$ is divided by x is $(-1)^n$
$\therefore (17)^{200} = (18-1)^{200}$
$\therefore$ Remainder = $(-1)^{200} = 1$

> **Alternate Method:**
> $a^n - b^n$ is completely divisible by a + b. If n is an even number in the case of $17^{200} \div 18$
> $17^{200} - 1^{200}$ is completely divisible by 17 + 1 = 18
> Here, 1 is remainder.
> Or in other words if a^n is divided by a + 1 and n is even number then it always left 1 as remainder.

21. (d) $4^1 = 4$; $4^2 = 16$; $4^3 = 64$; $4^4 = 256$; $4^5 = 1024$
Remainder on dividing 372 by 4 = 0
Remainder on dividing 373 by 4 = 1
$\therefore$ Required unit digit
= Unit's digit of the sum = 6 + 4 = 0

22. (a) $a * b = a^b$
$\therefore 5 * 3 = 5^3 = 5 \times 5 \times 5 = 125$

23. (c) $5^{71} + 5^{72} + 5^{73} = 5^{71}(1 + 5 + 5^2) = 5^{70} \times 5 \times 31$
$= 5^{71} \times 155$ which is exactly divisible by 155.

24. (d) Let the numbers be 10x and 10y where x and y are prime to each other.
$\therefore$ LCM = 10 xy
$\Rightarrow$ 10xy = 120 $\Rightarrow$ xy = 12
Posssible pairs = (3, 4) or (1, 12)
$\therefore$ Sum of the numbers = 30 + 40 = 70

> **Alternate Method:**
> If two different numbers are in form of ax and bx H.C.F of these numbers is x and L.C.M of these numbers is abx
> Now a and b are co-prime terms in L.C.M.
> $10 \times a \times b = 120$
> $a \times b = 12 \rightarrow 1 \times 12$
> 2×6 this is not a pair of co prime terms.
> 3×4

25. (d) Required remainder = Remainder obtained by dividing 2^2 by 5.
Remainder = 4

26. (a) Required time = LCM of 200, 300, 360 and 450 seconds = 1800 seconds.

27. (c) Required number = H.C.F of (140 – 4), (176 – 6) and (264 – 9) = H.C.F. of 136, 170 and 255.

$$\begin{array}{r} 136\overline{)255}(1 \\ 136 \\ \hline 119\overline{)136}(1 \\ 119 \\ \hline 17\overline{)119}(7 \\ 119 \\ \times \end{array}$$

$$\begin{array}{r} 136\overline{)170}(1 \\ 136 \\ \hline 34\overline{)136}(4 \\ 136 \\ \times \end{array}$$

$\therefore$ Required number = 17

> **Alternate Method:**
> Here divisible terms are 140 – 4 = 136, 176 – 6 = 170 and 264 – 9 = 255
> Now, difference between these numbers
> 170 – 136 = 34
> 225 – 170 = 85
> H.C.F of difference = 17
> Hence required number = 17.

28. (a) Let the 4 terms in A.P are a – 3d, a – d, a + d, a + 3d
According to question
$a - d + a + d = 110$ ... (1)
$(a - 3d)(a + 3d) = 2125$ ... (2)
From equation (1)
$a - d + a + d = 110$
$2a = 110 \Rightarrow a = 55$
From equation (2)
$(a - 3d)(a + 3d) = 2125$
$\Rightarrow a^2 - 9d^2 = 2125$
$\Rightarrow (55)^2 - 9d^2 = 2125$
$\Rightarrow 3025 - 9d^2 = 2125$
$\Rightarrow 900 = 9d^2 \Rightarrow d^2 = 100 \Rightarrow d = 10$
$\therefore$ a = 55, d = + 10
series would be :
25, 45, 65, 85
IIIrd term would be 65.

29. (b)

$$\begin{array}{r} 65\overline{)75070}(1154 \\ 65 \\ \hline 100 \\ 65 \\ \hline 357 \\ 325 \\ \hline 320 \\ 260 \\ \hline 60 \end{array}$$

$\therefore$ Required number
= 75070 + (65 – 60) = 75075

30. (a) $35-18=17$
$45-28=17$
$55-38=17$
i.e., difference between the divisor and corresponeding remainder is same.
LCM of 35, 45 and 55 = 3465
$\therefore$ Required number
$= 3465-17=3448$

31. (d)
$$\begin{array}{r} 4\ a\ 3 \\ 9\ 8\ 4 \\ \hline 1\,3\ b\ \ 7 \end{array}$$
$\because$ $13b7$ is exactly divisible by 11.
$\therefore b=9 \ \therefore a=1$
$\therefore a+b=9+1=10$

32. (d) Required number = HCF of
$(35-19)$, $(59-35)$ and $(59-19)$ = HCF 16, 24 and 40 = 8

33. (c) The pattern is :
$1^3-2=-1$
$2^3-2=6$
$3^3-2=25$
$4^3-2=62$
$5^3-2=123$
$6^3-2=214$
$7^3-2=$ $\boxed{341}$

34. (c) The pattern is :
$1+4=5$
$5+7\ (=4+3)=12$
$12+12\ (=7+5)=24$
$24+19\ (=12+7)=43$
$43+28\ (=19+9)=$ $\boxed{71}$

35. (b) LCM of 4, 5, 6 and 7 = 420
$\therefore$ Required number
$= 420k+3$ which is exactly divisible by 13.
$= 32\times 13k+4k+3$
Hence, $4k+3$ should be divisible by 13 for some value of k.
For $k=9$, $4k+3=39$ which is divisible by 13.
$\therefore$ Required number $= 420\times 9+3=3783$

36. (c) The sum forms A.P.
First term (a) = 1
Common difference (d) = 2

$$\text{Sum of 15 term} = \frac{n}{2}(2a+(n-1)d)$$

$$\text{Sum} = \frac{15}{2}(2\times 1+(15-1)2)$$

$$= \frac{15}{2}\times 30 = 225$$

37. (a) Here, $(48-38)=10$, $(64-54)=10$, $(90-80)=10$ and $(120-110)=10$.
$\therefore$ Required number = (L.C.M of 48, 64, 90 and 120) – 10
$= 2870$

38. (c) $(0.11)^3\,(1^3+2^3+.....+9^3)$
$= 0.001331\times 2025$

$$= \frac{1331}{40000}\approx 2.695$$

39. (a) Let the number be $10x+y$.
According to condition
$10x+y+18=10y+x$
$y-x=2$
So those numbers are 02, 13, 24, 35, 46, 57, 68, 79, 80
But 13 and 79 are prime numbers.

40. (d) $x=\dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}=\dfrac{\left(\sqrt{3}-\sqrt{2}\right)\left(\sqrt{3}-\sqrt{2}\right)}{\left(\sqrt{3}+\sqrt{2}\right)\left(\sqrt{3}-\sqrt{2}\right)}$

$$= \frac{\left(\sqrt{3}-\sqrt{2}\right)^2}{3-2} = 3+2-2\sqrt{3}.\ \sqrt{2} = 5-2\sqrt{6}$$

$$\therefore y=\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} = 5+2\sqrt{6}$$

$$\therefore x+y = 5-2\sqrt{6}+5+2\sqrt{6}=10$$

$$xy=\left(5-2\sqrt{6}\right)\cdot\left(5+2\sqrt{6}\right)$$

$= 25-24=1$
$\therefore x^3+y^3=(x+y)^3-3xy\,(x+y)$
$= (10)^3-3(10)=1000-30=970$

41. (b) If the numbers be $3x$ and $4x$, then
HCF $= x=5$
$\therefore$ Number = 15 and 20
$\therefore$ LCM $= 12x=12\times 5=60$

> **Alternate Method:**
> If two numbers are in the form of $3x$ and $4x$ then their L.C.M $= 3\times 4\times x$
> $= 3\times 4\times 5=60$

42. (c) LCM of $\dfrac{2}{3}, \dfrac{4}{9}, \dfrac{5}{6}$

$$\frac{LCM\ of\ (2,4,5)}{HCF\ of\ (3,9,6)}=\frac{20}{3}$$

43. (b) $228-18=210$ is exactly divisible biggest two digit no. i.e. 70

44. (d) $(100x+10y+z)-(x+y+z)=99x+9y$
$= 9\,(11x+y)$

45. (d) $t_{n+2}=t_n+t_{n+1}$
$t_2=t_2+t_2=3$
$t_4=t_3+t_2=3+2=5$
$t_5=t_4+t_3=3+5=8$

46. (c) HCF of two-prime numbers = 1
$\therefore$ Product of numbers = their LCM = 117

47. (b) Here, the first divisor (289) is a multiple of second divisor (17).
$\therefore$ Required remainder = Remainder obtained on dividing 18 by 17 = 1

48. (b) Largest two digit prime number is 97
$9^2 + 7^2 = 81 + 49 = 130$

49. (c) L.C.M of (38, 57) = 114
Multiple of 114 between 900 and 1000 = 912
number which leaves 23 = 912 + 23 = 935

50. (a) Next term will be

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

$$=\frac{3}{2}\times\frac{4}{3}\times\frac{5}{4}\times\frac{6}{5}=3$$

51. (a) H.C.F. of 403, 434 and 465 is 31.

52. (c) First number = $2 \times 44 = 88$

$$\text{Other number} = \frac{44\times 264}{88} = 132$$

53. (a) If they are equal number of rows and columns then,

$\sqrt{1369} = 37$

54. (b) The sum of Arithmetic Progression is given by

$$s = \frac{n}{2}(a + l)$$

$$66 = \frac{n}{2}(22-11) = \frac{n}{2}\times 11$$

$n = 12$

55. (b) Product of first fifty positive consecutive integers = $1 \times 2 \times .... \times 50 = 50!$
Largest possible value of n

$$=\left[\frac{50}{7}\right]+\left[\frac{50}{7^2}\right]=7+1=8$$

56. (d) Lowest 5 digit number = 10,000
The number which is divisible by 12, 18 and 21 is LCM of 12, 18, 12 which is 252.

$\frac{10000}{252}$ gives 172 as remainder

So, 252 – 172 = 80
10,000 + 80 = 10080
If 10080 when divided by 12, 18 and 21 gives 0 as remainder
So, 10080 is the least 5–digit number.

57. (c) $2^3 + 4^3 + 6^3 + ------ + 20^3$
$= 2^3 (1^3 + 2^3 + 3^3 + ------ + 10^3)$

$$= 2^3 \times \left(\frac{(n)(n+1)}{2}\right)^2 8 \times \left(\frac{10\times 11}{2}\right)^2 = 8 \times 3025$$

$= 24200$

58. (a) Number has to be less than 27. Let the number be x. On Dividing 2055 by 27, we get remainder as 3
Now, 3 + x = 27
$\therefore$ x = 24

59. (b) LCM of 6, 9, 12, 15 and 18

2	6,9,12,15,18
3	3,9,6,15,9
3	1,3,2,5,3
	1,1,2,5,1

LCM = $2 \times 3 \times 3 \times 2 \times 5 = 180$
Least number = 180 + 2 = 182

60. (b) To divide 451 * 603 by 9
(4 + 5 + 1 + * + 6 + 0 + 3) = (19 + *)
(19 + *) must be multiple of 9
$\therefore$ 19 + * = 27
* = 8

61. (a) 347XY as 347X0. Since 8 is a factor of 80.
347X0 is divisible by 8. It means last three digits 7X0 is divisible by 8.
Hence, X is 2 or 6
if X = 6, number is 34760. But this is not divisible by 80.
if X = 2, number is 34720, which is divisible by 80.
Therefore, number is 34720 with X = 2 and Y = 0.
$\therefore$ x + y = 2 + 0 = 2.

62. (c) LCM of 5 and 7 = 35
So, the numbers divisible by both 5 and 7 are multilpe of 35. Between 300 and 650. We have 10 multiple of 35.
They are : 315, 350, 385, 420, 455, 490, 525, 560, 595, 630.

63. (a) $\sqrt[3]{5} = 5^{\frac{1}{3}\times 12} = 5^4 = 625$

$\sqrt[4]{6} = 6^{\frac{1}{4}\times 12} = 6^3 = 216$

$\sqrt[6]{12} = 12^{\frac{1}{6}\times 12} = 12^2 = 144$

$\sqrt[12]{276} = 276^{\frac{1}{12}\times 12} = 276^1 = 276$

So, option (a) is correct.

64. (a) According to option,
$5000 \div 2 = 2500$
Hence, 2500 is a perfect square of 50.

65. (a) LCM of 57 and 93,

3	57, 93
	19, 31

$\Rightarrow$ $3 \times 19 \times 31 = 1767$.
So, Required answer is 1767.

66. (a) Let digit at ten's place be x and digit at unit's place be y.
$\therefore$ The number = 10x + y
When digit are interchanged, the new number
= 10y + x
According to question,
Product of digits = 27 i.e., xy = 27 ...(i)
Also,
10x + y + 54 = 10y + x

$9x - 9y = -54$

$x - y = -6$

$\therefore \quad x = y - 6$ ...(ii)

From (i) and (ii),

$y(y-6) = 27$

$y^2 - 6y - 27 = 0$

$y^2 - 9y + 3y - 27 = 0$

$(y-9)(y+3) = 0$

$\therefore \quad y = 9$ or $y = -3$

$\therefore \quad x = 3$

When $x = 3$, and $y = 9$

$\therefore$ Required number $= 10x + y$

$= 10 \times 3 + 9$

$\Rightarrow \quad 30 + 9 = 39.$

67. (d) The smallest number of 5 digits = 10000

Now, $\frac{10000}{88} = 113,$ and remainder is 56

$\therefore$ Required number $= 10000 + (88 - 56) = (10000 + 32)$

$= 10032.$

68. (b) Let third number = x

then,

second number = 2x

first number = 4 x

According to question

$$\frac{\left(\frac{1}{x} + \frac{1}{2x} + \frac{1}{4x}\right)}{3} = \frac{7}{12}$$

$\therefore \quad x = 9$

$\therefore$ first number $= 4x = 4 \times 1 = 4$

second number $= 2x = 2 \times 1 = 2$

third number $= x = 1$

69. (c) According to question

$26 < \sqrt{709} < 27$

Now, $(27)^2 = 729$

$\therefore \quad 729 - 709 = 20$

$\therefore$ 20 must be added to 709 to make it a perfect square.

70. (b) Here,

$\sqrt{10} + \sqrt{4} = 3.16 + 2 = 5.16$

$\sqrt{11} + \sqrt{3} = 3.31 + 1.73 = 5.04$

$\sqrt{7} + \sqrt{7} = 2.64 + 2.64 = 5.28$

So, $\sqrt{11} + \sqrt{3}$ is the smallest number.

71. (a) A number is divisible by 11, if difference of the sum of the digits at the even places and sum of digits at odd places is either 0 (zero) or a multiple of 11.

Now,

$(3 + N) - 4 = 0$

$3 + N - 4 = 0$

$N - 1 = 0$

$\therefore \quad N = 1$

72. (b) L.C.M. of 12, 16 and 54.

$12 = 2 \times 2 \times 3.$

$16 = 2 \times 2 \times 2 \times 2.$

$54 = 2 \times 3 \times 3 \times 3$

L.C.M. $= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 = 432$

Remainder = 7.

So, required number $= 432 + 7 = 439.$

But this is not divisible by 13.

so, next number is $432 \times 2 + 7 = 871.$

Number 871 is divisible by 13.

Hence, required number is 871.

Sum of its digits $= 8 + 7 + 1 = 16.$

73. (c) Any number that is divisible by 72 must be divisible by 3, 4, 8, and 9.

Now, a number is divisible by 4 when a number formed by its last two digits of that number is divisible by 4. 'y6' is divisible by 4, for

$y = 1, 3, 5, 7, 9$

Again a, number is divisible by 8, when a number formed by its last 3 digits is divisible by 8.

'9y6' is divisible by '8' for $y = 3, 7$

Now, for divisibility by 9, sum of its digits should be divisible by 9.

for $y = 3$, $'7 + 4 + x + 2 + 9 + 3 + 6' = 31 + x$

so, for $x = 5$, 36 is divisible by 9.

Now, is '7452936' which is divisible by '24' also, so, it is divisible '72'.

Now, $(2x + 3y) = 2 \times 5 + 3 \times 3 = 19.$

74. (b) Let the two numbers are $4x$ and $7x$.

H. C. F. of 4x and $7x = x$.

Now, $x = 26.$

So, two numbers are 4×26 and 7×26.

Sum of two numbers $= 4 \times 26 + 7 \times 26 = 11 \times 26 = 286.$

75. (b) $x^2 = 1489.96 = \frac{148996}{100}$

$$\therefore x = \sqrt{\frac{148996}{100}} = \sqrt{\left(\frac{386}{10}\right)^2} = \frac{386}{10} = 38.6$$

76. (d) $x = \frac{1}{12.13} + \frac{1}{13.14} + \frac{1}{14.15} + ... + \frac{1}{23.24}$

$= \frac{13-12}{12.13} + \frac{14-13}{13.14} + \frac{15-14}{14.15} + ... + \frac{24-23}{23.24}$

$= \frac{1}{12} - \frac{1}{13} + \frac{1}{13} - \frac{1}{14} + \frac{1}{14} - \frac{1}{15} + ... \frac{1}{23} - \frac{1}{24}$

$x = \frac{1}{12} - \frac{1}{24} = \frac{2-1}{24} = \frac{1}{24}$

$y = \frac{1}{36.37} + \frac{1}{37.38} + \frac{1}{38.39} + ... + \frac{1}{71.72}$

$$=\frac{37-36}{36.37}+\frac{38-37}{37.38}+\frac{39-38}{38.39}+....+\frac{72-71}{71.72}$$

$$=\frac{1}{36}-\frac{1}{37}+\frac{1}{37}-\frac{1}{38}+\frac{1}{38}-\frac{1}{39}+....+\frac{1}{71}-\frac{1}{72}$$

$$y=\frac{1}{36}-\frac{1}{72}=\frac{2-1}{72}=\frac{1}{72}$$

Now,

$$\frac{x}{y}=\frac{\frac{1}{24}}{\frac{1}{72}}=\frac{72}{24}=3$$

77. (d) L. C. M. of 11, 13 and 7
$= 11 \times 13 \times 7 = 1001.$
Now, from given option '259259' is divisible by '1001'.
Hence, '259259' is divisible by 11, 13 and 7.

78. (b) Any number which divisible by 44, must be divisible by 11 also is
And for any number divisible by 11 the difference of sum of its digits at odd and even places be divisible by 11.
For the given number 15x 1y2
$(x + y + 1) - (5 + 1 + 2) = 0$
$x + y = 7$

79. (b) 8439 x 53 is divisible by 99 i.e.
given number is divisible by 11
$\therefore (3 + x + 3 + 8) - (5 + 9 + 4) = 0,\ x = 4$

80. (b) To find the mediam
(1) Arrange the numbers in increasing order.
(2) Here we have even no. of term. So, we have to add the two middle terms and divide by 2.
Data arrange in increasing order

41 43 46 50 $\boxed{55\ \ 61}$ 68 76 85 95

Hence the median is $\frac{55+61}{2}=\frac{116}{2}=58$

81. (b) L.C.M. of 6 and 7 = 42
Smallest 3 digits number divisible by 6 and 7 is the same that is divisible by 42
and that number is $A = 42 \times 3 = 126$
Largest 4 digits number that is divisible by 6 and 7 is the some that is divisible by 42
and that number is $B = 238 \times 42 = 9996$
Now, $B - A. = 9996 - 126 = 9870$

82. (b) The rule of 8 $\Rightarrow$ If the last three digit of a whole number are divisible by 8 then the entire number is divisible by 8
Put $x = 0$ and we see that 504 is divided by 8.
So, 0 is smallest integer.

83. (c) H.C.F $= 2^3 \times 3^2$

84. (a) Men Marks

$$=\frac{10\times6+12\times5+14\times2+16\times2+18\times5}{20}=\frac{270}{20}=13.5$$

85. (d) We know that $(x^n + 1)$ is divisible by $(x + 1)$, for all odd values of n.

$\therefore 77^{77} + 77 = \{(77^{77} + 1) + 76\}$

Now, $(77^{77} + 1)$ will be divisible by $(77 + 1) = 78$
Hence, remainder = 76.

86. (c) 30 a 68 b

When a number is divisible by 11, then the difference of sum of odd places digits and the sum of even places digits is 0 or multiple of 11.

$(8 + a + 3) - (b + 6 + 0)$

$= (11 + a) - (6 + b)$

From the option,

If $b = 3$ then, $a = 9$

and it will divisible by 11.

87. (a) If a number is divisible by 99, then it will also divisible by 9 and 11.
8 4 7 5 6 3 9 A B
Divisibility by 11: The difference between the sum of odd places digits and sum of even places digits from right hand side should be zero or the factor of 11.
Divisibility by 9: The sum of digits should be divisible by 9.
Sum of digits $= 8 + 4 + 7 + 5 + 6 + 3 + 9 + A + B$
$= 42 + (A + B)$
$\therefore$ (A + B) should be 3 or 12.
Difference of odd places digits and even places digits
$= (B + 9 + 6 + 7 + 8) - (A + 3 + 5 + 4)$
$= B + 30 - (A + 12)$
$= (B - A) + 18$
$\therefore$ (B – A) should be 4
From the options, option 'a' satisfy the conditions.
$\therefore$ $A = 4, B = 8$
$A + B = 12$
$B - A = 4$

88. (c) Largest number woluld be HCF of (2036 – 12) and (233 – 13) or HCF of 2024, 220
$\therefore$ HCF of 2024 and 220 :
$2024 = 2 \times 4 \times 11 \times 23$
$220 = 2 \times 2 \times 5 \times 11$
$\therefore$ HCF = 44
So, the number would be 44.

89. (c) Weights of bag of tea,
350 kg, 280 kg, 340 kg, 270 kg, 360 kg, 310 kg, 300 kg
$\therefore$ Range = highest weight – lowest weight
= 360 – 270 = 90 kg

90. (c) $785x3678y$
divisibility of 8 = last three digits divisible by 8

$$\frac{78y}{8} \Rightarrow y = 4$$

divisibility of 9 = sum of digits divisible by 9
$x = 6$
$x - y = 6 - 4 = 2$

91. (c) Difference $= (11 - 7) \times 28 = 112$

92. (c) 1089 is divisible by 11.

$$\frac{1089}{15} = \text{Remainder } 9$$

$$\frac{1089}{18} = \text{Remainder } 9$$

$$\frac{1089}{36} = \text{Remainder } 9$$

93. (b) $\dfrac{14331433 \times 1422 \times 1425}{12}$

$$= \frac{1 \times 6 \times 9}{12} = \frac{54}{12}$$

= Remainder 6

94. (a) HCF of two numbers is $\Rightarrow 3$
Larger number $\Rightarrow 3a$
Smaller number $\Rightarrow 3b$
LCM $\Rightarrow (3a) \times 2$
$3 \times a \times b \Rightarrow 6 \times a$

$\boxed{b \Rightarrow 2}$

The smaller number is $\Rightarrow 3b \Rightarrow 3 \times 2 \Rightarrow 2 \Rightarrow 6$

95. (b) $5, 6, 8, x$
fourth proportional

$$\frac{5}{6} = \frac{8}{x}$$

$$x = \frac{8 \times 6}{5}$$

$\boldsymbol{x = 9.6}$

96. (a) for a number to be completely divisible by 3, sum of the digits of particular no. should be divisible by 3.
Taking sption (a) $7 + 3 + 4 + 5 + 9 + 3 + 2 = 33 \div 3 = 0$
Option (b) $5 + 4 + 3 + 9 + 7 + 6 + 3 = 37 \div 3 \neq 0$
Option (d) $3 + 2 + 6 + 2 + 7 + 3 + 5 = 28 \div 3 \neq 0$

97. (c) AP $\Rightarrow \{10, 12, 14, \ldots\ldots 98\}$
$a_n = a + (n - 1)\, d$
$98 = 10 + (n - 1)^2$
$88 = (n - 1) \times 2$
$44 + 1 = n$

$\boxed{n = 45}$

$$Sn = \frac{n}{2}(a + a_n) \Rightarrow \frac{45}{2}(10 + 98)$$

$$\Rightarrow \frac{45}{2} \times 108 \Rightarrow 45 \times 54 \Rightarrow 2430$$

98. (b) 239685 is the graetest number which is divisible by 3 but not by 9.
$2 + 3 + 9 + 6 + 8 + 5 = 33$ is divisible by 3.

99. (d) $L = 56\,H$
$\Rightarrow H + L = 1710 \Rightarrow H + 56H = 1710$
$\Rightarrow 57H = 1710$
$\Rightarrow H = 30$
$LCM = 56 \times 30 = 1680$
Let other number $= x$
$240 \times x = 30 \times 1680$
$\Rightarrow x = 210$

100. (c) Let the two numbers be a and b.
Their H.C.F. is 12.
So numbers could be $12a$ and $12b$ respectively.
Both the number should be multiple of 12
Now by using options
Only option 'C' is there which is not the multiple of 12 *i.e.*, 90.

101. (a) $A = B + 7$
$B = C + 16 \rightarrow C = B - 16$
A. T. Q
$A + B + C = 255$
$B + 7 + B + B - 16 = 255$
$3B = 264$
$B = 88.$
Then $A = 95$
$C = 72$
Value of $3A + C - 4B$
$= 3(95) + 72 - 4(88) = 5$

102. (d) 89 is prime number,
Prime no. is a number whose factor is either or the number itself.

103. (a) L.C.M. of a and b = 42
$ab = 42$
L. C. M. of 5a and 11b = 55ab
$\therefore$ L.C.M. of 5a and 11b $= 55 \times 42 = 2310$
$\because$ Both 5 and 11 are co-prime to each other.

104. (d) For a number to be divisible by 9 sum of all digits of a number will be divisible by 9.
so, 8x 5215 = 8 + x + 5 + 2 + 1 + 5 = 21 + x
Least value of x which makes 23 + x divisible by 9 is 6
i.e. 21 + 6 = 27.

105. (d) Least number divisible by 15 and 18 both = L.C.M. (15 and 18) = 90
Least number which is divisible by 15 and 18, leaves remainder 3 i.e = 90 + 3 = 93

106. (c) LCM of 15, 25
$15 \times 5 = 75$
$25 \times 3 = 75$
Hence, LCM is 75

107. (a) HCF of prime numbers is 1.

108. (b) Let LCM is a.

$\therefore$ HCF $= \frac{a}{20}$

According to question,

$a - \frac{a}{20} = 456$

$\Rightarrow \frac{19a}{20} = 456$

$\Rightarrow a = 24 \times 20 = 480$ (LCM)

$\therefore$ HCF $= \frac{480}{20} = 24$

So, 96 × other number = 480 × 24

$\Rightarrow$ other number $= \frac{480 \times 24}{96} = 120$

109. (b) One number × Other number = HCF × LCM

$\Rightarrow 77 \times$ Other number $= 11 \times 693$

$\Rightarrow$ Other number $= \frac{693}{7} = 99$

110. (b) LCM of 15, 20, 30, and 50 = 300

$\therefore \frac{17}{30} \times \frac{10}{10} = \frac{170}{300}; \frac{27}{50} \times \frac{6}{6} = \frac{162}{300}$

$\frac{7}{15} \times \frac{20}{20} = \frac{140}{300}; \frac{11}{20} \times \frac{15}{15} = \frac{165}{300}$

Hence, correct descending order

$= \frac{17}{30} > \frac{11}{20} > \frac{27}{50} > \frac{7}{15}$

111. (d) $11^2 = 121, 12^2 = 144$

Hence, whole numbers lie between 121 and 144

$= 144 - 121 - 1 = 22$

112. (b) If the sum of number's digits is divisible by 3, then the number is divisible by 3.

113. (c) As, 11p9q4 is divisible by 24.

So, pq4 is divisible by 8 for q = 4, 8

As, 11p9q4 is divisible by 3

So, p + q = 15 for greatest possible value.

Now p = 7 and q = 8 for greatest possible value.

pq $\Rightarrow 7 \times 8$

$\Rightarrow 56$

114. (c) The minimum distance that both of them can cover is LCM of 77 and 88

$\Rightarrow 616$ cm.

115. (b) Circumference of base $= 42\pi$.

$\Rightarrow 2\pi r = 42\pi$

$\Rightarrow r = \frac{42}{2} = 21$ cm

Hence, volume of cone

$= \frac{1}{3}\pi r^2 h = \frac{1}{3} \times \frac{22}{7} \times 21 \times 21 \times 24$

$= 22 \times 21 \times 24$

$= 11088\ \text{cm}^3$

116. (b) The difference of the sum of digits at odd position and sum of digits at even position in a number is 0 or 11, then the number is divisble by 11.

$|(7 + 2 + 6) - (5 + 5\ 3)| = |15 - 13| = 2$

Hence, 752563 is not divisible by 11.

117. (b) $15 = 3 \times 5$

$24 = 2 \times 2 \times 2 \times 3$

$35 = 5 \times 7$

$54 = 2 \times 3 \times 3 \times 3$

Hence, LCM of 15, 24, 35

and $54 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7 = 7560$.

118. (c) LCM of 17 and 36 = 612

Largest four digits number = 9999

Remainder $= \frac{9999}{612} = 207$

Hence, required largest four digits number

$= 9999 - 207 = 9792$.

119. (a) Product of two numbers = HCF × LCM

$5x \times 7x = 5 \times 175$

$\Rightarrow x^2 = \frac{5 \times 175}{35} = 25$

$\Rightarrow x = \sqrt{25} = 5$

Hence, larger number is $= 7 \times 5 = 35$

120. (c) Product of two number = HCF × LCM

$\Rightarrow 726 = 11 \times$ LCM

$\Rightarrow$ LCM $= \frac{726}{11} = 66$

121. (d) Let radius and height of cylinder are 3x and 5x.

Volume of frustum = Volume of cylinder

$\Rightarrow \frac{1}{3}\pi(R^2 + r^2 + Rr)h = \pi r_c^2 H$

$\Rightarrow \frac{1}{3}[(28)^2 + (7)^2 + 28 \times 7] \times 45 = (3x)^2 \times 5x$

$\Rightarrow 45x^3 = \frac{1}{3}[784 + 49 + 196] \times 45$

$\Rightarrow x^3 = \frac{1}{3} \times 1029 = 343$

$\Rightarrow x = \sqrt[3]{343} = 7$

$\therefore$ Radius $= 3 \times 7 = 21$

Height $= 5 \times 7 = 35$

Hence, curved surface area of cylinder $= 2\pi r_c H$

$= 2 \times \frac{22}{7} \times 21 \times 35 = 4620\ \text{cm}^2$.

122. (b) Product of numbers = HCF × LCM

$\Rightarrow 3x + 4x = 2700$

$\Rightarrow 12x^2 = 2700$

$\Rightarrow \quad x^2 = \frac{2700}{12} = 225$

$\Rightarrow \quad x = \sqrt{225} = 15$

Hence, sum of the numbers = $3x + 4x = 7x$

$= 7 \times 15 = 105.$

123. (b) A number is divisible by 3 if sum of digits of the number is divisible by 3.

A number is divisible by 11 if the difference of the sum of digits at odd position and sum of digits at even position in a number is 0 or 11.

Only 35508 and 35580 is divisible by 3.

Now check for 11-

$|(3 + 5 + 8) - (5 + 0)| = |16 - 5| = 11$

$|(3 + 5 + 0) - (5 + 8)| = |8 - 13| = 5$

(Not divisible)

So, 35508 is divisible by 11.

Hence, 35508 is divisible by 33.

124. (a) $x^2 - 8x + 15$

$= x^2 - 5x - 3x + 15$

$= (x - 5)(x - 3)$

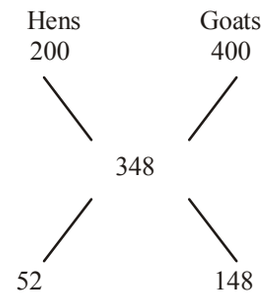
$x^2 - 5x + 6$

$= x^2 - 3x - 2x + 6$

$= (x - 3)(x - 2)$

Hence, LCM of $x^2 - 8x + 15$ and $x^2 - 5x + 6 = (x - 5)(x - 3)(x - 2)$.

125. (b)



$\Rightarrow$ 13 : 37

Hence, total number of goats = $\frac{100}{50} \times 37 = 74$

126. (b) $2 + 9 + 1 + 8 + 2 + 4 + 5 = 31$

So, this number is not divisible by 3, 9 and 12

and, $2 + 1 + 2 + 5 = 10, \ 9 + 8 + 4 = 21$

$\therefore 21 - 10 = 11$

So, 2918245 is divisible by 11.

127. (c) $[76 - \{90 \div 5 \times (24 - 36 \div 3) \div 3\}] = \left[76 - \left\{\frac{90}{5} \times \frac{12}{3}\right\}\right]$

$= 76 - 18 \times 4$

$= 76 - 72 = 4$

2 CHAPTER Simplification and Square & Cube Root

1. $\frac{0.125+0.027}{0.25-0.15+0.09}$ is equal to **(SSC CGL 1st Sit. 2010)**

(a) 0.3 (b) 0.5 (c) 0.8 (d) 0.9

2. The sum of the series $(1+0.6+0.06+0.006+0.0006+....)$ is **(SSC CGL 1st Sit. 2010)**

(a) $1\frac{2}{3}$ (b) $1\frac{1}{3}$ (c) $2\frac{1}{3}$ (d) $2\frac{2}{3}$

3. $\sqrt{\frac{0.009\times0.036\times0.016\times0.08}{0.002\times0.0008\times0.0002}}$ is equal to **(SSC CGL 1st Sit. 2010)**

(a) 34 (b) 36 (c) 38 (d) 39

4. The square root of 0.09 is **(SSC CGL 1st Sit. 2010)**

(a) 0.30 (b) 0.03 (c) 0.81 (d) 0.081

5. The number 0.121212.... in the form $\frac{p}{q}$ is equal to **(SSC CGL 1st Sit. 2010)**

(a) $\frac{4}{11}$ (b) $\frac{2}{11}$ (c) $\frac{4}{33}$ (d) $\frac{2}{33}$

6. By what least number should 675 be multiplied so as to obtain a perfect cube number ? **(SSC CGL 2nd Sit. 2010)**

(a) 3 (b) 5 (c) 24 (d) 40

7. $\left(1\frac{1}{2}+11\frac{1}{2}+111\frac{1}{2}+1111\frac{1}{2}\right)$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 1236 (b) $1234\frac{1}{2}$ (c) 618 (d) 617

8. $0.\overline{001}$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) $\frac{1}{1000}$ (b) $\frac{1}{999}$ (c) $\frac{1}{99}$ (d) $\frac{1}{9}$

9. $\frac{4.41\times0.16}{2.1\times1.6\times0.21}$ is simplified to **(SSC CGL 2nd Sit. 2010)**

(a) 1 (b) 0.1 (c) 0.01 (d) 10

10. $\frac{256\times256-144\times144}{112}$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 420 (b) 400 (c) 360 (d) 320

11. $(1^2+2^2+3^2+.....+10^2)$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 380 (b) 385 (c) 390 (d) 392

12. $\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\left(1-\frac{1}{5}\right)....\left(1-\frac{1}{25}\right)$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) $\frac{2}{25}$ (b) $\frac{1}{25}$

(c) $1\frac{19}{25}$ (d) $\frac{1}{325}$

13. Simplified form of $\left[\left(\sqrt[5]{x^{\frac{-3}{5}}}\right)^{-5/3}\right]^5$ is **(SSC CGL 2nd Sit. 2010)**

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

14. $(0.1\times0.01\times0.001\times10^7)$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 100 (b) $\frac{1}{10}$ (c) $\frac{1}{100}$ (d) 10

15. The least among the fractions $\frac{15}{16},\frac{19}{20},\frac{24}{25},\frac{34}{35}$ is **(SSC CGL 2nd Sit. 2010)**

(a) $\frac{34}{35}$ (b) $\frac{15}{16}$ (c) $\frac{19}{20}$ (d) $\frac{24}{25}$

16. $1.\overline{27}$ in the form $\frac{p}{q}$ is equal to **(SSC CGL 2st Sit. 2010)**

(a) $\frac{127}{100}$ (b) $\frac{73}{100}$ (c) $\frac{14}{11}$ (d) $\frac{11}{14}$

17. $\frac{3.25\times3.20-3.20\times3.05}{0.064}$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{10}$ (d) 10

18. Out of six consecutive natural numbers, if the sum of first three is 27, what is the sum of the other three ?
(SSC CGL 2nd Sit. 2010)
(a) 36 (b) 35 (c) 25 (d) 24

19. $\left\{\frac{(0.1)^2-(0.01)^2}{0.0001}+1\right\}$ is equal to **(SSC CGL 2nd Sit. 2010)**
(a) 1010 (b) 110 (c) 101 (d) 100

20. $\sqrt{6+\sqrt{6+\sqrt{6+\sqrt{6+...}}}}=?$ **(SSC CGL 1st Sit. 2011)**
(a) 2.3 (b) 3 (c) 6 (d) 6.3

21. The square root of $\left(\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}\right)$ is **(SSC CGL 1st Sit. 2011)**
(a) $\sqrt{3}+\sqrt{2}$ (b) $\sqrt{3}-\sqrt{2}$
(c) $\sqrt{2}\pm\sqrt{3}$ (d) $\sqrt{2}-\sqrt{3}$

22. The value of $\frac{2\frac{1}{3}-1\frac{2}{11}}{3+\frac{1}{3+\frac{1}{3+\frac{1}{3}}}}$ is **(SSC CGL 1st Sit. 2011)**
(a) $\frac{38}{109}$ (b) $\frac{109}{38}$ (c) 1 (d) $\frac{116}{109}$

23. The value of $\frac{3\sqrt{2}}{\sqrt{3}+\sqrt{6}}-\frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}+\frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}$ is
(SSC CGL 2011)
(a) 4 (b) 0 (c) $\sqrt{2}$ (d) $3\sqrt{6}$

24. $\frac{(0.05)^2+(0.41)^2+(0.073)^2}{(0.005)^2+(0.041)^2+(0.0073)^2}$ is **(SSC CGL 2011)**
(a) 10 (b) 100
(c) 1000 (d) None of these

25. If $9\sqrt{x}=\sqrt{12}+\sqrt{147}$, then x = ? **(SSC CGL 2011)**
(a) 2 (b) 3 (c) 4 (d) 5

26. $\sqrt[3]{1-\frac{127}{343}}$ is equal to **(SSC CGL 2nd Sit. 2011)**
(a) $\frac{5}{9}$ (b) $1-\frac{1}{7}$ (c) $\frac{4}{7}$ (d) $1-\frac{2}{7}$

27. If the sum of two numbers be multiplied by each number separately, the products so obtained are 247 and 114. The sum of the numbers is **(SSC CGL 2nd Sit. 2011)**
(a) 19 (b) 20 (c) 21 (d) 23

28. Find a number, one–seventh of which exceeds its eleventh part by 100. **(SSC CGL 2nd Sit. 2011)**
(a) 1925 (b) 1825 (c) 1540 (d) 1340

29. If $\frac{4\sqrt{3}+5\sqrt{2}}{\sqrt{48}+\sqrt{18}}=a+b\sqrt{6}$, then the values of a and b are respectively **(SSC CGL 2nd Sit. 2011)**
(a) $\frac{9}{15},-\frac{4}{15}$ (b) $\frac{3}{11},\frac{4}{33}$
(c) $\frac{9}{10},\frac{2}{5}$ (d) $\frac{3}{5},\frac{4}{15}$

30. If $x+\frac{2}{3+\frac{4}{5+\frac{7}{6}}}=10$, then the value of x is
(SSC CGL 2nd Sit. 2011)
(a) $\frac{1276}{135}$ (b) $\frac{53}{6}$ (c) 4.35 (d) 9

31. The value of $3+\frac{1}{\sqrt{3}}+\frac{1}{3+\sqrt{3}}+\frac{1}{\sqrt{3}-3}$ is
(SSC CGL 2nd Sit. 2011)
(a) $3+\sqrt{3}$ (b) 3 (c) 1 (d) 0

32. A student was asked to divide a number by 6 and add 12 to the quotient. He, however, first added 12 to the number and then divided it by 6, getting 112 as the answer. The correct answer should have been **(SSC CGL 2nd Sit. 2011)**
(a) 124 (b) 122 (c) 118 (d) 114

33. Last year my age was a perfect square number. Next year it will be a cubic number. What is my present age?
(SSC Sub. Ins. 2012)
(a) 25 years (b) 27 yearss
(c) 26 years (d) 24 years

34. What is the value of $(2.1)^2\times\sqrt{0.0441}$?
(SSC Sub. Ins. 2012)
(a) 0.9261 (b) 92.61 (c) 92.51 (d) 0.9251

35. The value of $\sqrt[3]{1372}\times\sqrt[3]{1458}$ is **(SSC Sub. Ins. 2012)**
(a) 116 (b) 126 (c) 106 (d) 136

36. If $\frac{547.527}{0.0082}=x$, then the value $\frac{547527}{82}$ is :
(SSC CHSL 2012)
(a) 10x (b) 100x (c) $\frac{x}{100}$ (d) $\frac{x}{10}$

37. If $\sqrt[3]{3^n}=27$, then the value of n is: **(SSC CHSL 2012)**
(a) 9 (b) 6 (c) 1 (d) 3

38. From 9.00 AM to 2.00 PM, the temperature rose at a constant rate from 21ºC to 36ºC. What was the temperature at noon ?
(SSC CHSL 2012)
(a) 27ºC (b) 30ºC (c) 32ºC (d) 28.5ºC

39. The value of $\left(\sqrt{6+\sqrt{6+\sqrt{6+.....upto...\infty}}}\right)$ is equal to **(SSC CGL 1st Sit. 2012)**

(a) 3 (b) 10 (c) 8 (d) 2

40. If $\sqrt{6}\times\sqrt{15}=x\sqrt{10}$, then the value of x is **(SSC CGL 2012)**

(a) 3 (b) ± 3 (c) $\sqrt{3}$ (d) $\sqrt{6}$

41. $3-\frac{3+\sqrt{5}}{4}-\frac{1}{3+\sqrt{5}}$ is equal to **(SSC CGL 2012)**

(a) 0 (b) $\frac{3}{2}$ (c) $\frac{\sqrt{5}}{2}$ (d) $\sqrt{5}$

42. A farmer divides his herd of n cows among his four sons, so that the first son gets one–half the herd, the second one–fourth, the third son $\frac{1}{5}$ and the fourth son 7 cows. Then the value of n is **(SSC CGL 2012)**

(a) 240 (b) 100 (c) 180 (d) 140

43. By what least number should 675 be multiplied to obtain a number which is a perfect cube? **(SSC CGL 2012)**

(a) 7 (b) 8 (c) 5 (d) 6

44. If $2\sqrt{x}=\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}-\frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$, then the value of x is: **(SSC CGL 2nd Sit. 2012)**

(a) 6 (b) 30 (c) $\sqrt{15}$ (d) 15

45. $\frac{1+876542\times 876544}{876543\times 876543}$ is equal to **(SSC CGL 2012)**

(a) 3 (b) 0 (c) 1 (d) 2

46. The simplest value of

$\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+\frac{1}{\sqrt{4}+\sqrt{5}}+\frac{1}{\sqrt{5}+\sqrt{6}}$ is **(SSC CGL 2012)**

(a) $\sqrt{3}\left(\sqrt{2}-1\right)$ (b) $\sqrt{2}\sqrt{3}-1)$

(d) $\sqrt{3}-1$ (d) $\sqrt{2}-1$

47. If 21 is added to a number, it becomes 7 less than thrice of the number. Then the number is **(SSC CGL 2012)**

(a) 14 (b) 161 (c) 18 (d) 19

48. The simplified value of $\frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}}$ is **(SSC Multi-Tasking 2013)**

(a) 4 (b) 3 (c) 2 (d) 6

49. $\sqrt{\frac{9.5\times 0.085}{0.0017\times 0.19}}$ equals **(SSC Multi-Tasking 2013)**

(a) 5 (b) 50 (c) 500 (d) 0.05

50. The value of $1+\frac{1}{1+\frac{2}{3+\frac{4}{5}}}$ is: **(SSC Sub. Ins. 2013)**

(a) $\frac{12}{29}$ (b) $\frac{8}{19}$ (c) $\frac{48}{29}$ (d) $\frac{2}{19}$

51. The value of

$\sqrt{19.36}+\sqrt{0.1936}+\sqrt{0.001936}+\sqrt{0.00001936}$ is: **(SSC Sub. Ins. 2013)**

(a) 4.8484 (b) 4.8694 (c) 4.8884 (d) 4.8234

52. The greatest among the following numbers $(3)^{\frac{1}{3}},(2)^{\frac{1}{2}},1,(6)^{\frac{1}{6}}$ is: **(SSC Sub. Ins. 2013)**

(a) $(2)^{\frac{1}{2}}$ (b) 1 (c) $(6)^{\frac{1}{6}}$ (d) $(3)^{\frac{1}{3}}$

53. The value of $\sqrt{40+\sqrt{9\sqrt{81}}}$ is **(SSC CHSL 2013)**

(a) 11 (b) $\sqrt{111}$ (c) 9 (d) 7

54. Which is greater $\sqrt[3]{2}$ or $\sqrt{3}$? **(SSC CHSL 2013)**

(a) Equal (b) Cannot be compared

(c) $\sqrt[3]{2}$ (d) $\sqrt{3}$

55. Find the value of $3+\frac{1}{\sqrt{3}}+\frac{1}{\sqrt{3}+3}+\frac{1}{\sqrt{3}-3}$. **(SSC CHSL 2013)**

(a) 6 (b) 3

(c) $\frac{3}{2\left(\sqrt{3}+3\right)}$ (d) $2\sqrt{3}$

56. If a number is as much greater than 31 as it is less than 75, then the number is. **(SSC CHSL 2013)**

(a) 53 (b) 106 (c) 44 (d) 74

57. If $\left(\frac{3}{4}\right)^{3}\left(\frac{4}{3}\right)^{-7}=\left(\frac{3}{4}\right)^{2x}$, then x is : **(SSC CGL 1st Sit. 2013)**

(a) 2½ (b) –2 (c) 2 (d) 5

58. Number of digits in the square root of 62478076 is : **(SSC CGL 2013)**

(a) 3 (b) 4 (c) 5 (d) 6

59. A rational number between $\frac{3}{4}$ and $\frac{3}{8}$ is **(SSC CGL 2013)**

(a) $\frac{16}{9}$ (b) $\frac{9}{16}$

(c) $\frac{12}{7}$ (d) $\frac{7}{3}$

60. Find the simplest value of $2\sqrt{50}+\sqrt{18}-\sqrt{72}$ (given $\sqrt{2}=1.414$). **(SSC CGL 2013)**

(a) 10.312 (b) 8.484 (c) 4.242 (d) 9.898

61. The numerator of a fraction is 4 less than its denominator. If the numerator is decreased by 2 and the denominator is increased by 1, then the denominator becomes eight times the numerator. Find the fraction. **(SSC CGL 2013)**

(a) $\frac{4}{8}$ (b) $\frac{2}{7}$ (c) $\frac{3}{8}$ (d) $\frac{3}{7}$

62. If $x^2 = y + z$, $y^2 = z + x$ and $z^2 = x + y$, then the value of $\frac{1}{1+x}+\frac{1}{1+y}+\frac{1}{1+z}$ is **(SSC CGL 2013)**

(a) 2 (b) 0 (c) -1 (d) 1

63. If $a=2$, $b=3$, then $(a^b+b^a)^{-1}$ is **(SSC CGL 2nd Sit. 2013)**

(a) $\frac{1}{31}$ (b) $\frac{1}{17}$ (c) $\frac{1}{21}$ (d) $\frac{1}{13}$

64. The smallest positive integer which when multiplied by 392, gives a perfect square is **(SSC CGL 2nd Sit. 2013)**

(a) 2 (b) 3 (c) 5 (d) 7

65. The fourth root of 24010000 is **(SSC CGL 2nd Sit. 2013)**

(a) 7 (b) 491 (c) 490 (d) 70

66. The greatest 4 digit member which is a perfect square, is **(SSC CGL 2nd Sit. 2013)**

(a) 9999 (b) 9909 (c) 9801 (d) 9081

67. The value of $\frac{4+3\sqrt{3}}{7+4\sqrt{3}}$ is **(SSC CGL 2nd Sit. 2013)**

(a) $5\sqrt{3}-8$ (b) $5\sqrt{3}+8$

(c) $8\sqrt{3}+5$ (d) $8\sqrt{3}-5$

68. Which one of the following is the minimum value of the sum of two integers whose product is 24? **(SSC CGL 2nd Sit. 2013)**

(a) 25 (b) 11 (c) 8 (d) 10

69. If $(2^3)^2 = 4^x$ then 3^x is equal to **(SSC CGL 2nd Sit. 2013)**

(a) 3 (b) 6 (c) 9 (d) 27

70. Evaluate $\frac{\sqrt{24}+\sqrt{6}}{\sqrt{24}-\sqrt{6}}$ **(SSC Sub. Ins. 2014)**

(a) 2 (b) 3 (c) 4 (d) 5

71. The value of $3\div\left[(8-5)\div\left\{(4-2)\div\left(2+\frac{8}{13}\right)\right\}\right]$ is **(SSC Sub. Ins. 2014)**

(a) $\frac{15}{17}$ (b) $\frac{13}{17}$

(c) $\frac{15}{19}$ (d) $\frac{13}{19}$

72. If '+' means ' $\div$ ', '$\times$' means '–', ' $\div$ ' means '$\times$' and '–' means '+', what will be the value of the following expression?
$9+3\div 4-8\times 2=?$ **(SSC Sub. Ins. 2014)**

(a) $6\frac{1}{4}$ (b) $6\frac{3}{4}$ (c) $-1\frac{3}{4}$ (d) 18

73. The next term of the sequence,
$\left(1+\frac{1}{2}\right),\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right),\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right),$ — is **(SSC Sub. Ins. 2014)**

(a) 3 (b) $\left(1+\frac{1}{5}\right)$

(c) 5 (d) $\left(1+\frac{1}{2}\right)\left(1+\frac{1}{5}\right)$

74. The simplified value of
$\left(\sqrt{6}+\sqrt{10}-\sqrt{21}-\sqrt{35}\right)\left(\sqrt{6}-\sqrt{10}+\sqrt{21}-\sqrt{35}\right)$ is **(SSC Sub. Ins. 2014)**

(a) 13 (b) 12 (c) 11 (d) 10

75. Ram left $\frac{1}{3}$ of his property to his widow and $\frac{3}{5}$ of the remainder to his daughter. He gave the rest to his son who received ₹ 6,400. How much was his original property worth? **(SSC CHSL 2014)**

(a) ₹16,000 (b) ₹32,000 (c) ₹ 24,000 (d) ₹ 1,600

76. Which one of the following is true ? **(SSC CHSL 2014)**

(a) $\sqrt{5}+\sqrt{3}>\sqrt{6}+\sqrt{2}$ (b) $\sqrt{5}+\sqrt{3}<\sqrt{6}+\sqrt{2}$

(c) $\sqrt{5}+\sqrt{3}=\sqrt{6}+\sqrt{2}$ (d) $(\sqrt{5}+\sqrt{3})(\sqrt{6}+\sqrt{2})=1$

77. Arrange the following in ascending order
3^{34}, 2^{51}, 7^{17}, we get **(SSC CGL 1st Sit. 2014)**

(a) $3^{34}>2^{51}>7^{17}$ (b) $7^{17}>2^{51}>3^{34}$

(c) $3^{34}>7^{17}>2^{51}$ (d) $2^{51}>3^{34}>7^{17}$

78. 2km 5m is equal to: **(SSC Sub. Ins. 2015)**

(a) 2.005 km (b) 2. 0005 km

(c) 2.5 km (d) 2.05 km

79. The simplified value of
$\frac{(0.0539-0.002)\times 0.4+0.56\times 0.07}{0.04\times 0.25}$ is: **(SSC Sub. Ins. 2015)**

(a) 59.96 (b) 599.6 (c) 0.5996 (d) 5.996

80. $\frac{\sqrt{10+\sqrt{25+\sqrt{108+\sqrt{154+\sqrt{225}}}}}}{3\sqrt{8}}=?$ **(SSC Sub. Ins. 2015)**

(a) 8 (b) $\frac{1}{2}$ (c) $\sqrt{2}/3$ (d) 4

81. If $3^{2x-y} = 3^{x+y} = \sqrt{27}$, then the value of 3^{x-y} will be : **(SSC Sub. Ins. 2015)**

(a) $\frac{1}{\sqrt{3}}$ (b) $\frac{1}{\sqrt{27}}$ (c) $\sqrt{3}$ (d) 3

82. The simplified value of following is :

$\left(\frac{3}{15}a^5b^5c^3 \times \frac{5}{9}ab^5c^4\right) \div \frac{10}{27}a^2bc^3$ **(SSC CHSL 2015)**

(a) $\frac{9}{10}a^2bc^4$ (b) $\frac{1}{10}a^4b^4c^{10}$

(c) $\frac{3}{10}a^4b^{10}c^4$ (d) $\frac{3}{10}ab^4c^3$

83. In an exam the sum of the scores of A and B is 120, that of B and C is 130 and that of C and A is 140. Then the score of C is : **(SSC CHSL 2015)**

(a) 65 (b) 60 (c) 70 (d) 75

84. The sum of four numbers is 48. When 5 and 1 are added to the first two; and 3 & 7 are subtracted from the 3rd & 4th, the numbers will be equal. The numbers are **(SSC CGL 1st Sit. 2015)**

(a) 4, 12, 12, 20 (b) 5, 11, 13, 19

(c) 6, 10, 14, 18 (d) 9, 7, 15, 17

85. The value of

$\frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{3-\sqrt{8}}$ is **(SSC CGL 1st Sit. 2015)**

(a) 0 (b) 1 (c) 5 (d) 7

86. Choose the incorrect relation(s) from the following:

(i) $\sqrt{6}+\sqrt{2} = \sqrt{5}+\sqrt{3}$ **(SSC CGL 1st Sit. 2015)**

(ii) $\sqrt{6}+\sqrt{2} < \sqrt{5}+\sqrt{3}$

(iii) $\sqrt{6}+\sqrt{2} > \sqrt{5}+\sqrt{3}$

(a) (i) (b) (ii)

(c) (i) and (iii) (d) (ii) and (iii)

87. If $x = \frac{1}{\sqrt{2}+1}$ then $(x+1)$ equals to **(SSC CGL 2nd Sit. 2015)**

(a) 2 (b) $\sqrt{2}-1$

(c) $\sqrt{2}+1$ (d) $\sqrt{2}$

88. If $\frac{3}{4}$ of a number is 7 more than $\frac{1}{6}$ of the number, then $\frac{5}{3}$ of the number is : **(SSC CGL 2015)**

(a) 15 (b) 18 (c) 12 (d) 20

89. The value of $\frac{(2.3)^3 + 0.027}{(2.3)^3 - 0.69 + 0.09}$ is : **(SSC CGL 2016)**

(a) 2 (b) 2.27 (c) 2.33 (d) 2.6

90. If the numbers $\sqrt[3]{9}$, $\sqrt[4]{20}$, $\sqrt[6]{25}$ are arranged in ascending order, then the right arrangement is **(SSC CGL 2016)**

(a) $\sqrt[6]{25} < \sqrt[4]{20} < \sqrt[3]{9}$

(b) $\sqrt[3]{9} < \sqrt[4]{20} < \sqrt[6]{25}$

(c) $\sqrt[4]{20} < \sqrt[6]{25} < \sqrt[3]{9}$

(d) $\sqrt[6]{25} < \sqrt[3]{9} < \sqrt[4]{20}$

91. If $\frac{1}{a+\frac{1}{b+\frac{1}{c+\frac{1}{2}}}} = \frac{16}{23}$, then the value of a + b + c **(SSC Sub Ins. 2016)**

(a) 6 (b) 3 (c) 9 (d) 12

92. The sum of two numbers is $15\frac{1}{3}$ and their difference is $4\frac{2}{3}$. The product of the numbers is **(SSC Sub Ins. 2016)**

(a) 50 (b) $48\frac{2}{3}$ (c) $53\frac{1}{3}$ (d) 60

93. If $2x - 3(2x-2) > x - 1 < 2 + 2x$, then x can take which of the following values? **(SSC CHSL 2017)**

(a) 2 (b) –2 (c) 4 (d) –4

94. If $N = (\sqrt{7}-\sqrt{3})/(\sqrt{7}+\sqrt{3})$, then what is the value of N+(1/N)? **(SSC Sub. Ins. 2017)**

(a) $2\sqrt{2}$ (b) 5 (c) 10 (d) 13

95. What is the simplified value of $(2+1)(2^2+1)(2^4+1)(2^8+1)$? **(SSC Sub. Ins. 2017)**

(a) 2^8-1 (b) $2^{16}-1$ (c) $2^{32}-1$ (d) $2^{64}-1$

96. $\frac{5.75\times5.75\times5.75+3.25\times3.25\times3.25}{57.5\times57.5+32.5\times32.5-57.5\times32.5}$ is equal to: **(SSC Sub. Ins. 2018)**

(a) 0.0009 (b) 0.9 (c) 0.009 (d) 0.09

97. The value of $3\frac{1}{5} - \left[2\frac{1}{2} - \left\{\frac{5}{6} - \left(\frac{2}{5} + \frac{3}{10} - \frac{4}{15}\right)\right\}\right]$ is: **(SSC Sub. Ins. 2018)**

(a) $\frac{11}{10}$ (b) $\frac{9}{10}$ (c) $\frac{13}{5}$ (d) $\frac{6}{5}$

98. $5\frac{5}{6} + \left[2\frac{2}{3} - \left\{3\frac{3}{4}\left(3\frac{4}{5} \div 9\frac{1}{2}\right)\right\}\right]$ is equal To: **(SSC Sub. Ins. 2018)**

(a) $\frac{44}{7}$ (b) 7 (c) $\frac{43}{6}$ (d) $\frac{22}{3}$

99. The simplified value of $\frac{0.01404}{24^2+6^2-144}$ is :

(SSC CHSL-2018)

(a) 3×10^{-5} (b) 6×10^{-5}
(c) 2.4×10^{-4} (d) 3×10^{-4}

100. The simplified value of

$\frac{1}{2}$ of $\frac{8}{5}\div\left\{2\frac{1}{5}-\left(\frac{5}{16}+\frac{3}{5}\times1\frac{7}{8}\div\frac{2}{3}\right)\right\}$ is: **(SSC CHSL-2018)**

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

101. The value of $4.5-(3.2\div0.8\times5)+3\times4\div6$ is:

(SSC CGL-2018)

(a) -13.5 (b) 4.2 (c) -8.5 (d) 5.7

102. The value of $15.2+5.8\div2.9\times2-3.5\times2\div0.5$ is equal to:

(SSC CGL-2018)

(a) 4.8 (b) 3.2 (c) 5.2 (d) 5.4

103. What is the value of:
$(9\div30)^2\times2.4+0.3$ o f $12\times(1-0.3)^2+9\times(0.3)^2=?$

(SSC MTS 2018)

(a) 3.43 (b) 3.69 (c) 2.79 (d) 2.17

104. What is the value of:
2 of $3\div3\times2+\{4\times3-(5\times2+3)\}=?$ **(SSC MTS 2018)**

(a) 3 (b) -24 (c) 6 (d) -21

105. If '+' means '–', '–' means '+', '×' means '÷' and '÷' means, '×', then the value of $\frac{42-12\times3+8\div2+15}{8\times2-4+9\div3}$ is :

(SSC CGL 2019-20)

(a) $\frac{15}{19}$ (b) $-\frac{5}{3}$ (c) $-\frac{15}{19}$ (d) $\frac{5}{3}$

106. What is the value of 32×4 of $2\times3+$

$\left[5\text{ of }6-\{7\text{ of }8(10+6\text{ of }\frac{5}{6}\times5-1)\div80\}\right]-7\times3\div2$?

(SSC MTS 2019-20)

(a) 7.5 (b) 17.5 (c) 12.5 (d) 24.5

107. What is the value of

$\frac{72\div9+3-6-(2\times3)+5\text{ of }3-(1+5\times2-2)}{8\div4+2-(6\times8\div2)+(7\times4-2\times2)}$?

(SSC MTS 2019-20)

(a) $\frac{11}{4}$ (b) $\frac{5}{4}$ (c) 0 (d) $\frac{15}{4}$

108. If $\frac{a}{b}=\frac{3}{4},\frac{b}{c}=\frac{4}{3}$ and $\frac{c}{d}=\frac{5}{6}$, then the sum of the numerator and the denominator (which are coprimes) of $\left(\frac{a}{d}\right)^{10}$ is :

(SSC MTS 2019-20)

(a) 1025 (b) 4097 (c) 2049 (d) 513

109. The value of $90\div20$ of $6\times[11\div4$ of $\{3\times2-(3-8)\}]\div(9\div3\times2)$ is: **(SSC CGL 2020-21)**

(a) $\frac{9}{8}$ (b) $\frac{3}{8}$ (c) $\frac{1}{36}$ (d) $\frac{1}{32}$

110. Simplify the following expression. **(SSC CHSL 2020-21)**

$5\frac{1}{3}\div\left[7-3\div\left(1-\frac{1}{4}\right)\times\frac{2}{3}+1\right]-3\div1+2$

(a) 15 (b) 0 (c) – 4 (d) $\frac{1}{41}$

111. The value of $\frac{7}{10}\div\frac{7}{5}of\left[\frac{21}{10}+\frac{13}{5}\right]+\left[\frac{1}{10}\times\frac{10}{47}-\frac{6}{47}\right]$ is :

(SSC MTS 2020-21)

(a) 1 (b) 10 (c) 0 (d) 5

112. What is the simplified value of **(SSC MTS 2020-21)**

$\left\{\left(4-\frac{2}{1+\frac{2}{1-\frac{1}{2+\frac{3}{4}}}}\right)\div1\frac{5}{12}\text{ of }\frac{72}{145}-(4+3\div0.5-1)\right\}$?

(a) 1 (b) -4 (c) -2 (d) 3

113. The value of $\frac{40-\frac{3}{4}\text{ of }32}{37-\frac{3}{4}\text{ of }(34-6)}$ is: **(SSC Sub-Inspector 2020-21)**

(a) $\frac{1}{2}$ (b) 1 (c) $-\frac{1}{2}$ (d) 0

114. The value of $8-3\div6$ of $2+(4\div4$ of $\frac{1}{4})\div8+(4\times8\div\frac{1}{4})\times\frac{1}{8}$ is : **(SSC Sub-Inspector 2020-21)**

(a) $\frac{7}{4}$ (b) $-\frac{97}{4}$ (c) $-\frac{7}{4}$ (d) $\frac{97}{4}$

115. The value of $\frac{6.35\times6.35\times6.35+3.65\times3.65\times3.65}{63.5\times63.5+36.5\times36.5-63.5\times36.5}$ is equal to: **(SSC Sub-Inspector 2020-21)**

(a) 0.1 (b) 10 (c) 1 (d) 0.01

116. If $A=\frac{1}{2}+\frac{1}{3}\times\frac{1}{4}\div\frac{1}{5}$ and $B=\frac{1}{2}\div\frac{1}{3}\times\frac{1}{4}+\frac{1}{5}$, then what is the value of A – B? **(SSC MTS- 2021-22)**

(a) $\frac{17}{20}$ (b) $\frac{9}{20}$ (c) $\frac{7}{40}$ (d) $\frac{1}{5}$

117. If $\frac{32\div16-5\times2}{11\div22\times8-5\times2}=\frac{1}{P}$, then what is the value of P?

(SSC MTS- 2021-22)

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

118. The value of $(4^3+4)\div[5^2-(7^2-41)]$ is:

(SSC CHSL 2021-2022)

(a) 8 (b) 17 (c) 5 (d) 4

119. Simplify $(957+932)^2-4\times957\times932$.

(SSC CHSL 2021-2022)

(a) 576 (b) 676 (c) 529 (d) 625

120. What is the value of $(.91)^3+-(.09)^3/[(.91)^2-.0819+(.09)^2]$?

(SSC CHSL 2023)

(a) 1 (b) 5 (c) 4 (d) 6

121. The value of $117\div45$ of $(1/5)+(12/5)\times(20/3)$ is:

(SSC CHSL 2023)

(a) 28 (b) 29 (c) 31 (d) 27

122. Find the value of the following expression:

$372\div56\times7-5+2$ **(SSC CGL 2021-22)**

(a) 58 (b) $-2\frac{95}{98}$ (c) $43\frac{1}{2}$ (d) $2\frac{93}{98}$

123. Solve the following. **(SSC Sub-Inspector 2022)**

$$\frac{24\div\frac{3}{8}\text{ of }(8+2\times\overline{7-3}+\left[\frac{2}{11}\div\frac{4}{55}-\left\{\frac{5}{8}+\frac{6}{16}\right\}\right]}{32\div\overline{15-7}+75\div(6+15\div3+4)}$$

(a) $\frac{23}{27}$ (b) $\frac{9}{2}$ (c) $\frac{11}{18}$ (d) $\frac{15}{19}$

124. The value of $\frac{\sqrt[3]{-2744}\times\sqrt[3]{-216}}{\sqrt[3]{\frac{64}{729}}}$ is:

(SSC Sub-Inspector 2022)

(a) 164 (b) 152 (c) 189 (d) 156

125. The value of $(1018)2-1019\times1017+1015\times1012-1016\times1011$ is:

(SSC Sub-Inspector 2022)

(a) 1 (b) 4 (c) 3 (d) 5

126. Simplify the following **(SSC Sub-Inspector 2022)**

$$81^{\frac{3}{4}}+[(20\div5\text{ of }3\times6)+\{(8\div24\text{ of }3)\times4\}-10\div5]-\left(\frac{1}{32}\right)^{-\frac{2}{5}}$$

(a) $24\frac{1}{4}$ (b) $21\frac{1}{9}$ (c) $27\frac{4}{5}$ (d) $29\frac{4}{9}$

127. What is the value of $28\times25\div7\times15+63\times56\div72\times5+24\times7+8$?

(SSC MTS 2022)

(a) 2101 (b) 1821
(c) 1921 (d) 1901

128. Find the value of $\frac{\sqrt{1.24}\times\sqrt{2.79}}{\sqrt{2.64}\times\sqrt{5.94}}$

(SSC CGL 2022, Tier-II)

(a) $\frac{31}{44}$ (b) $\frac{33}{64}$ (c) $\frac{31}{66}$ (d) $\frac{33}{31}$

129. What is the value of **(SSC CGL 2022, Tier-II)**

$$\left[\frac{1}{8}+\left\{\frac{1}{6}\times\left(\frac{36}{45}\div\frac{24}{25}\right)-\left(\frac{12}{21}\times\frac{14}{15}\div\frac{24}{25}\right)\right\}+\frac{27}{36}\right]?$$

(a) $\frac{1}{27}$ (b) $\frac{1}{108}$ (c) $\frac{1}{72}$ (d) $\frac{1}{36}$

130. Simplify: **(SSC MTS 2023)**

$(13\div13\text{ of }13+13)/(13\div13\times13+13)$

(a) $\frac{1}{26}$ (b) $\frac{15}{26}$ (c) $\frac{13}{96}$ (d) $\frac{85}{169}$

131. If $\sqrt[3]{0.08\times0.8\times p}=0.008\times0.8\times\sqrt[3]{q}$, then find the value of $\frac{p}{q}$: **(SSC CHSL 2023, Tier-II)**

(a) $8^3\times10^{-9}$ (b) $8^3\times10^{-8}$
(c) $8^4\times10^{-8}$ (d) $8^4\times10^{-9}$

132. If $X=\left(\frac{3}{2}\right)^2\times\left(\frac{2}{3}\right)^{-4}$, find the value of X^{-2}.

(SSC CHSL 2023, Tier-II)

(a) $\left(\frac{3}{2}\right)^{12}$ (b) $\left(\frac{2}{3}\right)^{6}$
(c) $\left(\frac{3}{2}\right)^{6}$ (d) $\left(\frac{2}{3}\right)^{12}$

133. Evaluate $\frac{0.04}{0.05}\text{of}\frac{\left(3\frac{1}{3}-2\frac{1}{2}\right)\div\frac{1}{2}\text{of}1\frac{1}{4}}{\frac{1}{3}+\frac{1}{5}\text{of}\frac{1}{9}}$

(SSC Sub-Inspector 2023)

(a) 0.3 (b) 5
(c) 3 (d) 0.03

134. The value of $11\times11+11\div11-11\times11+11+11\times11-11-11\times11$ is: **(SSC Sub-Inspector 2023)**

(a) 1 (b) 11
(c) 121 (d) 0

135. Simplify: $[0.08-\{3.5-4.9-(12.5-7.8-4.6)\}]$

(SSC CGL 2023, Tier-I)

(a) 2.58 (b) 0.08
(c) 12.58 (d) 1.58

HINTS & EXPLANATIONS

1. (c) If $0.5 = a$ and $0.3 = b$ then,

$$\text{Expression} = \frac{a^3 + b^3}{a^2 - ab + b^2}$$

$$= \frac{(a+b)(a^2 - ab + b^2)}{a^2 - ab + b^2} = a + b = 0.5 + 0.3 = 0.8$$

2. (a) $1 + 0.6 + 0.06 + 0.006 + 0.0006 + ... = 1.666...$

$$= 1.\bar{6} = 1\frac{6}{9} = 1\frac{2}{3}$$

3. (b) Expression

$$= \sqrt{\frac{0.009 \times 0.036 \times 0.016 \times 0.08}{0.002 \times 0.0008 \times 0.0002}} = \sqrt{\frac{9 \times 32 \times 16 \times 8}{2 \times 8 \times 2}}$$

$$= 3 \times 2 \times 3 \times 2 = 36$$

4. (a) $\sqrt{0.09} = \sqrt{0.3 \times 0.3} = 0.3$

5. (c) $0.121212.... = 0.\overline{12} = \frac{12}{99} = \frac{4}{33}$

6. (b) $675 = 5 \times 5 \times 3 \times 3 \times 3 = 5$

No. to be multiplied

7. (a) $1\frac{1}{2} + 11\frac{1}{2} + 111\frac{1}{2} + 1111\frac{1}{2} = 1234 + 2 = 1236$

8. (b) $0.\overline{001} = \frac{1}{999}$

9. (a) $\frac{4.41 \times 0.16}{2.1 \times 1.6 \times 0.21} = \frac{441 \times 16}{21 \times 16 \times 21} = 1$

10. (b) If $256 = a$ and $144 = b$, then

$$\frac{a^2 - b^2}{a - b}$$

$[a - b = 256 - 144 = 112]$

$$= \frac{(a+b)(a-b)}{(a-b)} = a + b = 256 + 144 = 400$$

11. (b) $1^2 + 2^2 + 3^2 + ... + n^2 = \frac{n(n+1)((2n+1)}{6}$

$$\therefore 1^2 + 2^2 + 3^2 + ... + 10^2 = \frac{10(10+1)(20+1)}{6} = 385$$

12. (a) $\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right)\left(1 - \frac{1}{5}\right).... \left(1 - \frac{1}{24}\right)\left(1 - \frac{1}{25}\right)$

$$= \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} ..... \times \frac{23}{24} \times \frac{24}{25} = \frac{2}{25}$$

13. (c) $\left[\left(\sqrt[5]{x^{-3/5}}\right)^{\frac{-5}{3}}\right]^5 = \left(x^{-\frac{3}{5}}\right)^{\frac{1}{5} \times \frac{-5}{3} \times 5} = x^{-\frac{3}{5} \times \frac{-5}{3}} = x$

14. (d) $0.1 \times 0.01 \times 0.001 \times 10^7 = 10^{-6} \times 10^7 = 10$

15. (b) $\frac{15}{16} = 0.94$; $\frac{19}{20} = 0.95$

$$\frac{24}{25} = 0.96; \frac{34}{35} = 0.97$$

16. (c) $1.\overline{27} = 1\frac{27}{99} = 1\frac{3}{11} = \frac{14}{11}$

17. (d) $\frac{3.20(3.25 - 3.05)}{0.064}$

$$= \frac{3.20 \times 0.20}{0.064} = 10$$

18. (a) $8 + 9 + 10 = 27$

$11 + 12 + 13 = 36$

So, let 3 consecutive no x, x + 1, x + 2

Next 3 consecutive no x + 3; x + 4, x + 5

i.e. sum of last 3 consecutive no. is 9 more than sum of first $3 = 27 + 9 = 36$

19. (d) $\frac{0.01 - 0.0001}{0.0001} + 1 = \frac{0.0099}{0.0001} + 1 = 99 + 1 = 100$

20. (b) $\sqrt{6 + \sqrt{6 + \sqrt{6.....}}} = x$

$6 = 3 \times 2$

By trick = 3 answer

21. (a) $\text{Expression} = \frac{(\sqrt{3} + \sqrt{2})}{(\sqrt{3} - \sqrt{2})}$

Rationalising the denominator,

$$\frac{(\sqrt{3} + \sqrt{2})(\sqrt{3} + \sqrt{2})}{(\sqrt{3} - \sqrt{2})(\sqrt{3} + \sqrt{2})} = \frac{(\sqrt{3} + \sqrt{2})^2}{3 - 2} = (\sqrt{3} + \sqrt{2})^2$$

$$\therefore \sqrt{\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}} = \sqrt{(\sqrt{3} + \sqrt{2})^2} = \sqrt{3} + \sqrt{2}$$

22. (a) Expression

$$= \frac{\frac{7}{3} - \frac{13}{11}}{3 + \frac{1}{3 + \frac{1}{\frac{9+1}{3}}}} = \frac{\frac{77 - 39}{33}}{3 + \frac{1}{3 + \frac{3}{10}}}$$

$$= \frac{\frac{38}{33}}{3 + \frac{1}{\frac{30+3}{10}}} = \frac{\frac{38}{33}}{3 + \frac{10}{33}} = \frac{\frac{38}{33}}{\frac{99+10}{33}} = \frac{38}{33} \times \frac{33}{109} = \frac{38}{109}$$

23. (b) Expression

$$= \frac{3\sqrt{2}}{\sqrt{3}+\sqrt{6}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} + \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}$$

$$= \frac{3\sqrt{2}(\sqrt{6}-\sqrt{3})}{(\sqrt{6}+\sqrt{3})(\sqrt{6}-\sqrt{3})} - \frac{4\sqrt{3}(\sqrt{6}-\sqrt{2})}{(\sqrt{6}+\sqrt{2})(\sqrt{6}-\sqrt{2})} + \frac{\sqrt{6}}{(\sqrt{3}+\sqrt{2})} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$$

$$= \frac{3\sqrt{2}(\sqrt{6}-\sqrt{3})}{(6-3)} - \frac{4\sqrt{3}(\sqrt{6}-\sqrt{2})}{(6-2)} + \frac{\sqrt{6}(\sqrt{3}-\sqrt{2})}{(3-2)}$$

$$= \sqrt{2}(\sqrt{6}-\sqrt{3}) - \sqrt{3}(\sqrt{6}-\sqrt{2}) + \sqrt{6}(\sqrt{3}-\sqrt{2})$$

$$= \sqrt{12} - \sqrt{6} - \sqrt{18} + \sqrt{6} + \sqrt{18} - \sqrt{12} = 0$$

24. (b) $\dfrac{(0.05)^2+(0.41)^2+(0.073)^2}{(0.005)^2+(0.041)^2+(0.0003)^2}$

$$\frac{(0.05)^2+(0.41)^2+(0.073)^2}{\frac{1}{100}(0.05)^2+(0.41)^2+(0.073)^2} = 100$$

25. (b) $9\sqrt{x} = \sqrt{3\times2\times2} + \sqrt{3\times7\times7}$

$\Rightarrow 9\sqrt{x} = 2\sqrt{3} + 7\sqrt{3} = 9\sqrt{3}$

$\therefore\ x = 3$

26. (b) $\sqrt[3]{1-\dfrac{127}{343}} = \sqrt[3]{\dfrac{343-127}{343}}$

$$= \sqrt[3]{\frac{216}{343}} = \sqrt[3]{\frac{(6)^3}{(7)^3}} = \frac{6}{7} = 1 - \frac{1}{7}$$

27. (a) Let the numbers be x and y.

$\therefore x(x+y) = 247$

and $y(x+y) = 114$

$\Rightarrow x^2 + xy = 247$ and $xy + y^2 = 114$

On adding;

$x^2 + xy + xy + y^2 = 247 + 114$

$\Rightarrow x^2 + 2xy + y^2 = 361$

$\Rightarrow (x+y)^2 = 19^2 \Rightarrow x + y = 19$

28. (a) Let the number be x.

$$\therefore \frac{x}{7} - \frac{x}{11} = 100$$

$$\Rightarrow \frac{11x - 7x}{11\times7} = 100$$

$$\Rightarrow 4x = 77\times100$$

$$\Rightarrow x = \frac{77\times100}{4} = 1925$$

29. (d) $\dfrac{4\sqrt{3}+5\sqrt{2}}{\sqrt{48}+\sqrt{18}}$

$$\Rightarrow \frac{4\sqrt{3}+3\sqrt{2}+2\sqrt{2}}{4\sqrt{3}+3\sqrt{2}} \Rightarrow \frac{1+2\sqrt{2}}{4\sqrt{3}+3\sqrt{2}}$$

By Rationalising

$$\frac{1+2\sqrt{2}(4\sqrt{3}-3\sqrt{2})}{(4\sqrt{3}+3\sqrt{2})(4\sqrt{3}-3\sqrt{2})}$$

$$\frac{1+8\sqrt{6}-12}{48-18},\ \frac{1+8\sqrt{6}-12}{30},\ \frac{30-12+8\sqrt{6}}{30}$$

$$\frac{18}{30} + \frac{18}{30}\sqrt{6} = a + b\sqrt{6}$$

$$\frac{3}{5} + \frac{4}{15}\sqrt{6} = a + b\sqrt{6}$$

$$a = \frac{3}{5},\quad b = \frac{4}{15}$$

30. (a) $x + \dfrac{2}{\dfrac{3+\dfrac{4}{\dfrac{30+7}{6}}}} = 10 \Rightarrow x + \dfrac{2}{3+\dfrac{4\times6}{37}}$

$$\Rightarrow x + \frac{2}{3+\frac{24}{37}} = 10 \Rightarrow x + \frac{2}{\frac{111+24}{37}} = 10$$

$$\Rightarrow x + \frac{2\times37}{135} = 10 \Rightarrow x + \frac{74}{135} = 10$$

$$\Rightarrow x = 10 - \frac{74}{135} = \frac{1350-74}{135} = \frac{1276}{135}$$

31. (b) $3 + \dfrac{1}{\sqrt{3}} + \left(\dfrac{1}{3+\sqrt{3}} - \dfrac{1}{3-\sqrt{3}}\right)$

$$= 3 + \frac{1}{\sqrt{3}} + \left(\frac{3-\sqrt{3}-3-\sqrt{3}}{(3+\sqrt{3})(3-\sqrt{3})}\right)$$

$$= 3 + \frac{1}{\sqrt{3}} + \frac{-2\sqrt{3}}{9-3} = 3 + \frac{1}{\sqrt{3}} - \frac{\sqrt{3}}{3} = 3 + \frac{1}{\sqrt{3}} - \frac{1}{\sqrt{3}} = 3$$

32. (b) Let the number be x

$$\therefore \frac{x+12}{6} = 112$$

$\Rightarrow x + 12 = 672$

$\Rightarrow x = 672 - 12 = 660$

$$\therefore \text{Correct answer} = \frac{660}{6} + 12 = 110 + 12 = 122$$

33. (c) By going options, 26 years is the present age. Present age be 26, then last year age was 25 which represents a perfect square and next year age would be 27 which represents a cubic number.

34. (a) Expression is $(2.1)^2 \times \sqrt{0.0441} = 4.41 \times 0.21$

$= 0.9261$

35. (b) $\sqrt[3]{1372} \times \sqrt[3]{1458}$

$= 7\sqrt[3]{4} \times 9\sqrt[3]{2} = 63 \times \sqrt[3]{4\times2} = 63\times2 = 126$

36. (d) $\frac{547.527}{0.0082} = x \Rightarrow \frac{547527}{1000} \times \frac{10000}{82} = x$

$\Rightarrow \frac{547527}{82} = \frac{x \times 1000}{10000} \Rightarrow \frac{x}{10}$

37. (a) $\left[3^n\right]^{\frac{1}{3}} = 27$

$\Rightarrow \quad 3^{\frac{n}{3}} = 3^3$

Comparing, $\frac{n}{3} = 3$

$x = 9$

38. (b) Time difference between 9.00 A.M & 2.00 P.M = 5 hours
Temperature difference between 21°C & 36°C
= 36 – 21 = 15°C
Now, Time difference between 9.00 A.M & 12.00 Noon
= 3 hrs.

In 5 hours $\xrightarrow[\text{difference}]{\text{temperature}}$ 15°C

So, In 3 hours $\xrightarrow[\text{difference}]{\text{temperature}} \left(\frac{15}{5} \times 3\right) = 9°C$

So, temperature at noon = 21 + 9 = 30°C

39. (a) $x = \sqrt{6 + \sqrt{6 + \sqrt{6 + ...\infty}}}$

On squaring,

$x^2 = 6 + \sqrt{6 + \sqrt{6 + ...\infty}}$
$\Rightarrow x^2 = 6 + x$
$\Rightarrow x^2 - x - 6 = 0$
$\Rightarrow x^2 - 3x + 2x - 6 = 0$
$\Rightarrow x(x-3) + 2(x-3) = 0$
$\Rightarrow (x-3)(x+2) = 0$
$\Rightarrow x = 3$ because $x \neq -2$

By trick $3 \times 2 = 6$

40. (a) $\sqrt{6} \times \sqrt{15} = x\sqrt{10}$
$\Rightarrow \sqrt{2 \times 3} \times \sqrt{3 \times 5} = x\sqrt{10}$
$\Rightarrow \sqrt{2} \times \sqrt{5} \times 3 = x\sqrt{10}$
$\Rightarrow 3\sqrt{10} = x\sqrt{10} \Rightarrow x = 3$

41. (b) $\frac{1}{3+\sqrt{5}} = \frac{3-\sqrt{5}}{(3+\sqrt{5})(3-\sqrt{5})}$

$= \frac{3-\sqrt{5}}{9-5} = \frac{3-\sqrt{5}}{4}$

$\therefore 3 - \frac{3+\sqrt{5}}{4} - \frac{3-\sqrt{5}}{4}$

$= \frac{12-3-\sqrt{5}-3+\sqrt{5}}{4} = \frac{6}{4} = \frac{3}{2}$

42. (d) According to the question,

$\frac{n}{2} + \frac{n}{4} + \frac{n}{5} + 7 = n$

$\Rightarrow \frac{10n + 5n + 4n}{20} + 7 = n$

$\Rightarrow \frac{19n}{20} + 7 = n \Rightarrow n - \frac{19n}{20} = 7$

$\Rightarrow \frac{n}{20} = 7 \Rightarrow n = 20 \times 7 = 140$

43. (c) $675 = 5 \times 5 \times 3 \times 3 \times 3$
$= 3^3 \times 5^2$
$\therefore$ Required number = 5

44. (d) $2\sqrt{x} = \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} - \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$

$= \frac{(\sqrt{5}+\sqrt{3})^2 - (\sqrt{5}-\sqrt{3})^2}{(\sqrt{5}-\sqrt{3})(\sqrt{5}+\sqrt{3})} = \frac{4.\sqrt{5}.\sqrt{3}}{5-3} = 2\sqrt{15}$

$\therefore 2\sqrt{x} = 2\sqrt{15} \Rightarrow x = 15$

45. (c) $\frac{1 + 876542(876542+2)}{(876542+1)^2}$

$= \frac{1 + (876542)^2 + 2 \times 876542}{(876542+1)^2} = \frac{(876542+1)^2}{(876542+1)^2} = 1$

46. (b) $\frac{1}{\sqrt{2}+\sqrt{3}}$

$= \frac{1}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}} = \frac{\sqrt{3}-\sqrt{2}}{3-2}$

$= \sqrt{3} - \sqrt{2}$

$\therefore \frac{1}{\sqrt{4}+\sqrt{3}} = \sqrt{4} - \sqrt{3};$

$\frac{1}{\sqrt{4}+\sqrt{5}} = \sqrt{5} - \sqrt{4};$

$\frac{1}{\sqrt{5}+\sqrt{6}} = \sqrt{6} - \sqrt{5}$

$\therefore$ Expression

$= \sqrt{3} - \sqrt{2} + \sqrt{4} - \sqrt{3} + \sqrt{5} - \sqrt{4} + \sqrt{6} - \sqrt{5}$

$= \sqrt{6} - \sqrt{2} = \sqrt{2}(\sqrt{3} - 1)$

47. (a) If the number be x, then
$x + 21 = 3x - 7$
$\Rightarrow 3x - x = 21 + 7 \Rightarrow 2x = 28$
$\Rightarrow x = 14$

48. (c) $\frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}} = \frac{\sqrt{2\times2\times2\times2\times2} + \sqrt{2\times2\times2\times2\times3}}{\sqrt{2\times2\times2} + \sqrt{2\times2\times3}}$

$\Rightarrow \frac{4\sqrt{2}+4\sqrt{3}}{2\sqrt{2}+2\sqrt{3}} = \frac{2(2\sqrt{2}+2\sqrt{3})}{(2\sqrt{2}+2\sqrt{3})} = 2$