📘 **SSC CGL Quant Formula (All Chapters)**

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🔢 **A. Number System (1–10)**

1. **HCF × LCM = Product of two numbers**

2. If one number divides another → **HCF = smaller, LCM = larger**

3. **HCF of fractions** = HCF of numerators / LCM of denominators

4. **LCM of fractions** = LCM of numerators / HCF of denominators

5. **HCF(0, a) = a**

6. **LCM(0, a) = 0**

7. Smallest number divisible by given numbers = **LCM**

8. Greatest number dividing numbers leaving same remainder = **HCF of differences**

9. Product of two coprime numbers = **LCM**

10. If a = HCF × x and b = HCF × y → **LCM = HCF × x × y**

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➗ **B. Simplification & BODMAS (11–20)**

11. **BODMAS Rule:** Brackets → Orders → Division → Multiplication → Addition → Subtraction

12. $a^0 = 1$

13. $a^{-n} = \frac{1}{a^n}$

14. $(a/b)^{-n} = (b/a)^n$

15. $\sqrt{a^2} = a$

16. $(a + b)^2 = a^2 + b^2 + 2ab$

17. $(a - b)^2 = a^2 + b^2 - 2ab$

18. $a^2 - b^2 = (a - b)(a + b)$

19. $\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$

20. $a^m \times a^n = a^{m+n}$

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📊 **C. Percentage (21–30)**

21. Percentage = $\frac{\text{Value}}{\text{Total}} \times 100$

22. x% of y = $\frac{x}{100} \times y$

23. Increase% = $\frac{\text{Increase}}{\text{Original}} \times 100$

24. Decrease% = $\frac{Decrease}{Original} \times 100$

25. Successive % change = $a + b + \frac{ab}{100}$

26. x% increase ⇒ multiplier = $\frac{100+x}{100}$

27. x% decrease ⇒ multiplier = $\frac{100-x}{100}$

28. Population formula = $P(1 + \frac{x}{100})^n$

29. % error = $\frac{Error}{True\ value} \times 100$

30. If A is x% more than B → B is $\frac{x}{100+x} \times 100\%$ less than A

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### 💰 D. Profit & Loss (31–40)

31. Profit = SP − CP

32. Loss = CP − SP

33. Profit% = $\frac{Profit}{CP} \times 100$

34. Loss% = $\frac{Loss}{CP} \times 100$

35. SP = $\frac{100+Profit\%}{100} \times CP$

36. SP = $\frac{100-Loss\%}{100} \times CP$

37. CP = $\frac{100}{100+Profit\%} \times SP$

38. Discount = MP − SP

39. Discount% = $\frac{Discount}{MP} \times 100$

40. Successive discount = $a + b - \frac{ab}{100}$

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### ⏱ E. Time & Work (41–50)

41. Work = Rate × Time

42. If A can do work in x days → 1 day work = $\frac{1}{x}$

43. Together work = Sum of individual works

44. A is x% more efficient than B → time ratio = (100 : 100+x)

45. Pipes & Cisterns → Use work method

46. If A & B together do work in x days → work/day = 1/x

47. Men–Days formula = $M_1D_1 = M_2D_2$

48. Work ∝ Number of men

49. Efficiency ∝ Work done

50. Total work = LCM of individual days

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🚗 **F. Time, Speed & Distance (51–60)**

51. Speed = Distance / Time

52. Distance = Speed × Time

53. Time = Distance / Speed

54. Average speed = $\frac{Total distance}{Total time}$

55. Equal distances avg speed = $\frac{2xy}{x+y}$

56. Train crossing pole = $\frac{Train length}{Speed}$

57. Train crossing platform = $\frac{Train+platform}{Speed}$

58. Relative speed (same direction) = Difference

59. Relative speed (opposite direction) = Sum

60. Boat–stream: Downstream = u+v, Upstream = u−v

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📐 **G. Geometry (61–70)**

61. Sum of angles of triangle = 180°

62. Each angle of equilateral triangle = 60°

63. Area of triangle = $\frac{1}{2}bh$

64. Area of equilateral triangle = $\frac{\sqrt{3}}{4}a^2$

65. Pythagoras theorem = $a^2 + b^2 = c^2$

66. Area of rectangle = l × b

67. Perimeter of rectangle = 2(l+b)

68. Area of square = a²

69. Perimeter of square = 4a

70. Sum of interior angles of polygon = (n−2)×180°

● **H. Mensuration (71–85)**

71. Circumference of circle = 2πr

72. Area of circle = πr²

73. Area of semicircle = $\frac{1}{2}\pi r^2$

74. Volume of cube = a³

75. TSA of cube = 6a²

76. Volume of cuboid = lbh

77. TSA of cuboid = 2(lb+bh+hl)

78. Volume of cylinder = πr²h

79. CSA of cylinder = 2πrh

80. Volume of cone = $\frac{1}{3}\pi r^2 h$

81. CSA of cone = πrl

82. Volume of sphere = $\frac{4}{3}\pi r^3$

83. CSA of sphere = 4πr²

84. Hemisphere volume = $\frac{2}{3}\pi r^3$

85. Hemisphere CSA = 2πr²

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📈 **I. Ratio, Average & Misc (86–100)**

86. Ratio a:b = a/b

87. If a:b = x:y → a= kx, b=ky

88. Average = Sum / Number

89. New avg = $\frac{Old\ total \pm x}{n \pm 1}$

90. Weighted avg = $\frac{\Sigma wx}{\Sigma w}$

91. Mixture formula = $\frac{C-D}{D-B}$

92. Alligation rule (cross method)

93. Mean proportional = √(ab)

94. Third proportional = $b^2/a$

95. Simple Interest = $\frac{PTR}{100}$

96. Amount = P + SI

97. Compound Interest = $P(1 + \frac{R}{100})^n - P$

98. If CI for 2 years – SI = $P(\frac{R}{100})^2$

99. Probability = Favorable / Total

100.          Complement probability = 1 – P(E)