PREVIOUS YEAR PAPER

# SSC CGL 2017 Tier II — Quantitative Abilities — 19 February 2018

SSC CGL · 19 February 2018 · 10:30 AM - 12:30 PM

85 of the paper's 100 questions · marks per question not printed on the response sheet · 120 minutes

Left out of the original paper: 15 (any question that needs a figure or formatting we cannot show, has no answer in the response sheet, or could not be checked against a second copy of the paper).

Questions from the Staff Selection Commission's paper of 19 February 2018, 10:30 AM - 12:30 PM. Each question is followed by its answer, and the answer key is repeated on the last page.

Take it as a timed practice test: exambharo.com/ssc-cgl/previous-year-papers/ssc-cgl-2017-tier-2-quant-19-feb/

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## Quantitative Abilities

1. If N = 1 + 11 + 111 + 1111 + ... +111111111, then what is the sum of the digit's of N?
   (a) 45
   (b) 18
   (c) 36
   (d) 5
   **Answer: (a)**

2. What is the sum of first 40 terms of 1 + 3 + 4 + 5 + 7 + 10 + 9 + ...?
   (a) 1010
   (b) 1115
   (c) 1030
   (d) 1031
   **Answer: (c)**

8. What is the unit digit of 15 + 25 + 35 + ... + 205?
   (a) 0
   (b) 5
   (c) 2
   (d) 4
   **Answer: (a)**

9. x, y and z are prime numbers and x + y + z = 38. What is the maximum value of x?
   (a) 19
   (b) 23
   (c) 31
   (d) 29
   **Answer: (c)**

10. N is the smallest three digit prime number. When N is divided by 13, then what will be the remainder?

(a) 8

(b) 9

(c) 7

(d) 10

**Answer: (d)**

11. How many natural numbers are there between √261 and √45109?

(a) 144

(b) 196

(c) 168

(d) 195

**Answer: (b)**

12. What is the value of √121 + √12321 + √1234321 + √123454321?

(a) 12345

(b) 123456

(c) 12344

(d) 123454

**Answer: (c)**

13. p3 + q3 + r3 – 3pqr = 4. If a = q + r, b = r + p and c = p + q, then what is the value of a3 + b3 + c3 – 3abc?

(a) 4

(b) 8

(c) 2

(d) 12

**Answer: (b)**

14. If α and β are the roots of the equation x2 + x – 1 = 0, then what is the equation whose roots are α 5 and β5?

(a) x2 + 7x – 1 = 0

(b) x2 – 7x – 1 = 0

(c) x2 – 11x – 1 = 0

(d) x2 + 11x – 1 = 0

**Answer: (d)**

15. If x and y are natural numbers such that x + y = 2017, then what is the value of (– 1)x + (– 1)y?

(a) 2

(b) – 2

(c) 0

(d) 1

**Answer: (c)**

16. If x + (1/x) = (√3 + 1)/2, then what is the value of x4 + (1/x4)?
    (a) (4√3 – 1)/4
    (b) (4√3 + 1)/2
    (c) (–4√3 – 1)/4
    (d) (–4√3 – 1)/2
    **Answer: (c)**

17. If a + a2 + a3 – 1 = 0, then what is the value of a3 + (1/a)?
    (a) 1
    (b) 4
    (c) 2
    (d) 3
    **Answer: (c)**

18. If a – (1/a) = b, b – (1/b) = c and c – (1/c) = a, then what is the value of (1/ab) + (1/bc) + (1/ca)?
    (a) – 3
    (b) – 6
    (c) – 1
    (d) – 9
    **Answer: (a)**

19. If the roots of the equation a(b – c)x2 +b(c – a)x + , – b) = 0 are equal, then which of the following is true?
    (a) b = ( a + c)/ ac
    (b) 2/ b = (1/ a) + (1/ c)
    (c) 2 b = (1/ a) + (1/ c)
    (d) abc = ab + bc + ca
    **Answer: (b)**

20. If [√(a2 + b2 + ab)] + [√(a2 + b2 – ab)] = 1, then what is the value of (1 – a2)(1 – b2)?
    (a) 1/4
    (b) 4/7
    (c) 5/4
    (d) 3/4
    **Answer: (d)**

21. If 3x + 4y – 11 = 18 and 8x – 6y + 12 = 6, then what is the value of 5x – 3y – 9?
    (a) 18
    (b) – 9
    (c) – 27
    (d) – 18
    **Answer: (b)**

22. If a + b + c = 7/12, 3a – 4b + 5c = 3/4 and 7a – 11b – 13c = – 7/12, then what is the value of a + c?

(a) 1/2

(b) 5/12

(c) 3/4

(d) 1/4

**Answer: (b)**

24. In triangle PQR, C is the centroid. PQ = 30 cm, QR = 36 cm and PR = 50 cm. If D is the midpoint of QR, then what is the length (in cm) of CD?

(a) (4√86)/3

(b) (2√86)/3

(c) (5√86)/3

(d) (5√86)/2

**Answer: (a)**

27. Two circles are having radii 9 cm and 12 cm. The distance between their centres is 15 cm. What is the length (in cm) of their common chord?

(a) 6.8

(b) 13.6

(c) 7.2

(d) 14.4

**Answer: (d)**

28. Two circles touch each other at point X. Two common tangents of the circles meet at point P and none of the tangents passes through X. These tangents touch the larger circle at points B and C. If the radius of the larger circle is 15 cm and PB = 20 cm, then what is the radius (in cm) of the smaller circle?

(a) 3.5

(b) 3.75

(c) 4.25

(d) 4.45

**Answer: (b)**

29. Two circles touch each other at point X. A common tangent touch them at two distinct points Y and Z. If another tangent passing through X cut YZ at A and XA= 16 cm, then what is the value (in cm) of YZ?

(a) 18

(b) 24

(c) 16

(d) 32

**Answer: (d)**

30. There are 8 equidistant points A, B, C, D, E, F, G and H (in same order) on a circle. What is the value of ∠FDH (in degrees)?

(a) 22.5

(b) 45

(c) 30

(d) 42.5

**Answer: (b)**

33. An equilateral triangle of area 300 cm2 is cut from its three vertices to form a regular hexagon. Area of hexagon is what percent of the area of triangle?

(a) 66.66%

(b) 33.33%

(c) 83.33%

(d) 56.41%

**Answer: (a)**

39. The sum of radii of the two circles is 91 cm and the difference between their area is 2002 cm2. What is the radius (in cm) of the larger circle?

(a) 56

(b) 42

(c) 63

(d) 49

**Answer: (d)**

40. A right triangular prism has equilateral triangle as its base. Side of the triangle is 15 cm. Height of the prism is 20√3 cm. What is the volume (in cm3) of the prism?

(a) 1125

(b) 6750

(c) 4500

(d) 3375

**Answer: (d)**

41. The height of a cone is 45 cm. It is cut at a height of 15 cm from its base by a plane parallel to its base. If the volume of the smaller cone is 18480 cm3, then what is the volume (in cm3) of the original cone?

(a) 34650

(b) 61600

(c) 36960

(d) 62370

**Answer: (d)**

42. The ratio of the curved surface area and total surface area of a right circular cylinder is 2 : 5. If the total surface area is 3080 cm2, then what is the volume (in cm3) of the cylinder?

(a) 4312√6

(b) 3822√6

(c) 4522√6

(d) 4642√6

**Answer: (a)**

43. The radius and height of a solid cylinder are increased by 2% each. What will be the approximate percentage increase in volume?

(a) 6.76

(b) 5.88

(c) 6.12

(d) 3.34

**Answer: (c)**

44. A sphere of radius 21 cm is cut into 8 identical parts by 3 cuts (1 cut along each axis). What will be the total surface area (in cm2) of each part?

(a) 844.5

(b) 1732.5

(c) 1039.5

(d) 1115.6

**Answer: (b)**

45. Two identical hemispheres of maximum possible size are cut from a solid cube of side 14 cm. The bases of the hemispheres are part of the opposite faces of cube. What is the total volume (in cm3) of the remaining part of the cube?

(a) 1556.33

(b) 898.5

(c) 1467.33

(d) 1306.67

**Answer: (d)**

46. Identical cubes of largest possible size are cut from a solid cuboid of size 65 cm × 26 cm × 3.9 cm. What is the total surface area (in cm2) of all the small cubes taken together?

(a) 30420

(b) 15210

(c) 20280

(d) 16440

**Answer: (a)**

47. A regular triangular pyramid is cut by 2 planes which are parallel to its base. The planes trisects the altitude of the pyramid. Volume of top, middle and bottom part is V1, V2 and V3 respectively. What is the value of V1 :V2 : V3?

(a) 1 : 8 : 27

(b) 1 : 8 : 19

(c) 2 : 9 : 27

(d) 1 : 7 : 19

**Answer: (d)**

48. What is the value of [(cos 7A + cos 5A)÷(sin 7A – sin 5A)]?

(a) tan A

(b) tan 4 A

(c) cot 4 A

(d) cot A

**Answer: (d)**

49. What is the value of [1 – sin (90 – 2A)] / [1 + sin (90 + 2A)]?

(a) sinA cosA

(b) cot2A

(c) tan2A

(d) sin2A cosA

**Answer: (c)**

50. What is the value of sin 75o + sin 15o?

(a) √3

(b) 2√3

(c) √(3/2)

(d) 3/√2

**Answer: (c)**

51. What is the value of [(cos 3θ + 2cos 5θ + cos 7θ)÷(cos θ + 2cos 3θ + cos 5θ)] + sin 2θ tan 3θ?

(a) cos 2θ

(b) sin 2θ

(c) tan 2θ

(d) cot θ sin 2θ

**Answer: (a)**

52. What is the value of [2 sin (45 + θ) sin (45 – θ)]/cos 2θ?

(a) 0

(b) tan 2θ

(c) cot 2θ

(d) 1

**Answer: (d)**

53. What is the value of sin (90o + 2A)[4 – cos2 (90o – 2A)]?

(a) 2(cos3 A – sin3 A)

(b) 2(cos3 A + sin3 A)

(c) 4(cos6 A+ sin6 A)

(d) 4(cos6 A – sin6 A)

**Answer: (d)**

54. What is the value of [cos (90 + A)÷sec (270 – A)] + [sin (270 + A)÷cosec (630 – A)]?

(a) 3 sec A

(b) tan A sec A

(c) 0

(d) 1

**Answer: (d)**

55. On walking 100 metres towards a building in a horizontal line, the angle of elevation of its top changes from 45o to 60o. What will be the height (in metres) of the building?

(a) 50(3 + √3)

(b) 100(√3 + 1)

(c) 150

(d) 100√3

**Answer: (a)**

56. The upper part of a tree broken over by the wind ake an angle of 60o with the ground. The distance between the root and the point where top ne tree touches the ground is 25 metres. What was the height (in metres) of the tree

(a) 84.14

(b) 93.3

(c) 98.25

(d) 120.24

**Answer: (b)**

57. The height of a tower is 300 meters. When its top is seen from top of another tower,then the angle of depression is 60°. The horizontal distance between the bases of the two towers is 120 metres. What is the height (in metres) of the small tower?

(a) 88.24

(b) 106.71

(c) 92.15

(d) 112.64

**Answer: (c)**

58. How many employees of department A and C together are living in city Z?

(a) 9000

(b) 9200

(c) 8800

(d) 8200

**Answer: (c)**

59. Male employees of department E is what percent of the employees living in city Z from department A?

(a) 1600

(b) 2400

(c) 3200

(d) 4200

**Answer: (c)**

60. What is the ratio of male employee working in department B and D together to female employee working in department A and E together?

(a) 13 : 8

(b) 25 : 7

(c) 23 : 9

(d) 7 : 9

**Answer: (b)**

61. On an average how many residents of city Y are working in each department?

(a) 11360

(b) 12420

(c) 9130

(d) 10940

**Answer: (a)**

62. What are the total number of employee in department A and E together?

(a) 29400

(b) 17600

(c) 46400

(d) 36800

**Answer: (d)**

63. If a dairy mixes cow's milk which contains 10% fat with buffalo's milk which contains 20% fat, then the resulting mixture has fat (120/7)% of fat. What ratio was the cow's milk mixed with buffalo's milk?

(a) 2 : 5

(b) 1 : 5

(c) 2 : 3

(d) 2 : 1

**Answer: (a)**

64. In what ratio should tea costing Rs 300/kg be mixed with tea costing Rs 200/kg so that the cost of the mixture is Rs 225/kg?

(a) 3 : 1

(b) 1 : 3

(c) 1 : 4

(d) 4 : 1

**Answer: (b)**

65. A and B started a partnership business investing some amount in the ratio of 5 : 6. C joined then after 6 months with an amount equal to 2/3rd of B. What was their profit (in Rs) at the end of the year if C got Rs 21,600 as his share?

(a) 46800

(b) 56160

(c) 70200

(d) 1,40,400

**Answer: (d)**

66. A and B invest in a business in the ratio 2 : 5. If 50% of the total profit goes to charity and A's share is Rs 3.6 lakhs, the total profit is Rs _____ lakhs.

(a) 12.6

(b) 25.2

(c) 37.8

(d) 16.8

**Answer: (b)**

67. A is thrice as productive as C. Together they complete a job in 22.5 days. If B joins them after they have worked for 15 days then in how many days can they finish the rest of the job if B alone can do the job in 15 days?

(a) 6

(b) 3

(c) 9

(d) 2

**Answer: (b)**

68. If A, B and C can do a job working alone in 12, 18 and 36 days respectively. They all work together for 2 day, then B quits. How many days will A and C take to finish rest of the job?

(a) 9

(b) 6

(c) 3

(d) 4

**Answer: (b)**

69. If A, B and C together do a job in 4 days, A and C together do the job in 4.5 days and B and C together do the job in 12 days then in how many days can C alone do the job?

(a) 36

(b) 6

(c) 18

(d) 12

**Answer: (c)**

70. If A alone can do a job in 40 days then, in how many days can B alone do the job if together they can do the job in 8 days?

(a) 15

(b) 10

(c) 20

(d) 25

**Answer: (b)**

71. 1 bottle of honey costs Rs 240 but a pack of 4 of the same bottles costs Rs 768. What is the effective discount (in %) on the pack?

(a) 16

(b) 25

(c) 10

(d) 20

**Answer: (d)**

72. If the cost price of an article is Rs x . It is marked up by 100%. It is sold at Rs 1,200 after giving 20% discount. What is value of x?

(a) 750

(b) 1500

(c) 1000

(d) 2000

**Answer: (a)**

73. A Rs 1000 box of cookies is offered at 10% discount and a Rs 400 bar of chocolate at 8% discount. If we buy 2 boxes of cookies and 3 bars of chocolate, what is the effective discount we get (in %)?

(a) 9

(b) 9.25

(c) 8.75

(d) 8.5

**Answer: (b)**

74. The price of a product after getting 20% discount is Rs 3,024 which includes 5% tax on selling price. What was the marked price (in Rs) of the product?

(a) 3780

(b) 2742

(c) 3600

(d) 2880

**Answer: (c)**

75. and 2200 tickets were sold.

(a) 44000

(b) 440000

(c) 39600

(d) 396000

**Answer: (a)**

76. If 2A = 3B = 8C; What is A : B : C?

(a) 8 : 3 : 2

(b) 8 : 4 : 3

(c) 2 : 3 : 8

(d) 12 : 8 : 3

**Answer: (d)**

77. What is the Number of candidates who had appli f the ratio of selected to unselected was 14 : 25. If 35 less had applied and 10 less selected, the o of selected to unselected would have been 3 : 5?

(a) 195

(b) 205

(c) 185

(d) 175

**Answer: (a)**

78. What is the fourth proportional to 6, 24 and 83?

(a) 249

(b) 332

(c) 166

(d) 498

**Answer: (b)**

79. Rs 10,200 has to be divided between A,B & C so that A gets 2/3 of what B gets and B gets 1/4 of what C gets. How much more does C get over A (in Rs)? 10,200

(a) 6000

(b) 7200

(c) 1800

(d) 1200

**Answer: (a)**

80. Before a battle there were the ratio of captains to soldiers was 2 : 7. During the war 25 captains and 100 soldiers were martyred. The new ratio of captains to soldiers became 3 : 10. What is the number of soldiers after the war?

(a) 250

(b) 200

(c) 150

(d) 100

**Answer: (a)**

81. The average marks of 18 students in an examination was 60. It was later found that the marks of one student had been wrongly entered as 63 instead of 36. The correct average is:

(a) 59

(b) 59.5

(c) 58

(d) 58.5

**Answer: (d)**

82. In a class of 60 students there are 20 girls who scored an average of 40 marks in the test, what is the average marks of the boys if the class average is 60 marks?

(a) 60

(b) 70

(c) 50

(d) 80

**Answer: (b)**

83. The average of 44 consecutive odd numb 44.What is the largest number? 44

(a) 189

(b) 191

(c) 187

(d) 193

**Answer: (c)**

84. A batsman makes 100 runs in the 25th match of his career. His average runs per match increases by 1.4. Find his average before the 25th match.

(a) 65

(b) 55

(c) 75

(d) 45

**Answer: (a)**

85. An oil refinery buys oil at Rs 3600 per barrel. There is 10% wastage. If the refinery wants to earn 5% profit then at what price should it sell including 8% tax on selling price? (in Rs per barrel)

(a) 3674

(b) 3711

(c) 4219

(d) 4536

**Answer: (d)**

86. A vendor sells a coconut at Rs 24 and suffers 24% loss. If he wants to make 14% profit, then at what price (in Rs) should he sell?

(a) 32

(b) 30

(c) 36

(d) 28

**Answer: (c)**

87. A villager buys a goat and a sheep together for Rs 14,250. He sold the sheep at a profit of 10% and the goat at a loss of 20%. If he sold both the animals at the same price , then what was the cost price of the cheaper animal?

(a) 8250

(b) 6600

(c) 7500

(d) 6000

**Answer: (d)**

88. On a certain item profit is 120%. If the cost increases by 10% then what will be the new profit margin (in %) if selling price remains the same?

(a) 50

(b) 60

(c) 100

(d) 90

**Answer: (c)**

89. If 35% are the passing marks. A student gets 200 marks yet fails by 24 marks. What is the maximum marks?

(a) 820

(b) 550

(c) 640

(d) 680

**Answer: (c)**

90. A student gets 22 marks more in French than what she got in German. Her German marks are 28% of the sum of her French and German marks. What are her French marks?

(a) 14

(b) 36

(c) 18

(d) 42

**Answer: (b)**

91. 2% of a = b, then b% of 10 is the same as:

(a) 200% of a

(b) 20% of a/100

(c) 20% of a/10

(d) 200% of a/10

**Answer: (b)**

92. A man's annual income has increased by Rs 1.2 lakhs but the tax on income that he has to pay has reduced from 12% to 10%. He now pays the same amount of tax as before. What is his increased income (in Rs lakhs)?

(a) 8.4

(b) 7.2

(c) 9.6

(d) 6

**Answer: (b)**

93. A car travelling at an average speed of [illegible] km/[illegible] takes 9 minutes to travel a certain distance. By how much should it increase its speed (in km/[illegible]) travel the same distance in 8 minutes?

(a) 8

(b) 9

(c) 7

(d) 6

**Answer: (b)**

94. Train A takes 1 hour more than train B to travel a distance of 720 km. Due to engine trouble speed of train B falls by a third, so it takes 3 hours more than Train A to complete the same journey? What is the speed of Train A (in km/hr)?

(a) 80

(b) 90

(c) 60

(d) 70

**Answer: (a)**

95. Two cars A and B travel from one city to another city, at speeds of 60 km/hr and 108 km/hr respectively. If car B takes 2 hours lesser time than car A for the journey, then what is the distance (in km) between the two cities?

(a) 240

(b) 270

(c) 300

(d) 330

**Answer: (b)**

96. B starts 4.5 minutes after A from the same point, for a place at a distance of 3.5 miles from the starting point. A on reaching the destination turns back and walk a mile where he meets B. If A's speed is a mile in 6 minutes then B's speed is a mile in ____ minutes?

(a) 8

(b) 10

(c) 12

(d) 9

**Answer: (d)**

97. If compound interest received on a certain amount in the 3rd year is Rs. 12,100, what will be the compound interest (in Rs) for the 4th year on the same amount if rate of interest is 9%?

(a) 17080

(b) 15669

(c) 13189

(d) 14376

**Answer: (c)**

98. The amount received at 10% per annum compound interest after 3 yrs is Rs 10,648. What was the principal (in Rs)?

(a) 8000

(b) 9000

(c) 8500

(d) 7500

**Answer: (a)**

99. In how many years will Rs 25,000 yield Rs 8,275 as compound interest at 10% per annum compounded annually?

(a) 2

(b) 4

(c) 3

(d) 5

**Answer: (c)**

100. What is the rate of interest if simple interest earned on a certain sum for the 3rd year is Rs 1,750 and compound interest earned for 2 years is Rs 3622.5?

(a) 8

(b) 9

(c) 10

(d) 7

**Answer: (d)**

# Answer key

Answer key as marked in the Staff Selection Commission's response sheet. "—" means the sheet did not show it clearly.

## Quantitative Abilities

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **(a)** | 2 | **(c)** | 8 | **(a)** | 9 | **(c)** | 10 | **(d)** | 11 | **(b)** | 12 | **(c)** | 13 | **(b)** |
| 14 | **(d)** | 15 | **(c)** | 16 | **(c)** | 17 | **(c)** | 18 | **(a)** | 19 | **(b)** | 20 | **(d)** | 21 | **(b)** |
| 22 | **(b)** | 24 | **(a)** | 27 | **(d)** | 28 | **(b)** | 29 | **(d)** | 30 | **(b)** | 33 | **(a)** | 39 | **(d)** |
| 40 | **(d)** | 41 | **(d)** | 42 | **(a)** | 43 | **(c)** | 44 | **(b)** | 45 | **(d)** | 46 | **(a)** | 47 | **(d)** |
| 48 | **(d)** | 49 | **(c)** | 50 | **(c)** | 51 | **(a)** | 52 | **(d)** | 53 | **(d)** | 54 | **(d)** | 55 | **(a)** |
| 56 | **(b)** | 57 | **(c)** | 58 | **(c)** | 59 | **(c)** | 60 | **(b)** | 61 | **(a)** | 62 | **(d)** | 63 | **(a)** |
| 64 | **(b)** | 65 | **(d)** | 66 | **(b)** | 67 | **(b)** | 68 | **(b)** | 69 | **(c)** | 70 | **(b)** | 71 | **(d)** |
| 72 | **(a)** | 73 | **(b)** | 74 | **(c)** | 75 | **(a)** | 76 | **(d)** | 77 | **(a)** | 78 | **(b)** | 79 | **(a)** |
| 80 | **(a)** | 81 | **(d)** | 82 | **(b)** | 83 | **(c)** | 84 | **(a)** | 85 | **(d)** | 86 | **(c)** | 87 | **(d)** |
| 88 | **(c)** | 89 | **(c)** | 90 | **(b)** | 91 | **(b)** | 92 | **(b)** | 93 | **(b)** | 94 | **(a)** | 95 | **(b)** |
| 96 | **(d)** | 97 | **(c)** | 98 | **(a)** | 99 | **(c)** | 100 | **(d)** | | | | | | |