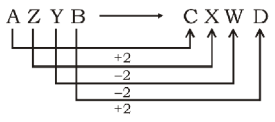
SSC CGL - 180616 GRAND TEST
HINTS AND SOLUTIONS

ANSWER KEY

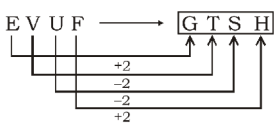
1	(4)	26	(4)	51	(1)	76	(4)
2	(1)	27	(2)	52	(2)	77	(3)
3	(2)	28	(3)	53	(2)	78	(2)
4	(3)	29	(3)	54	(2)	79	(3)
5	(4)	30	(3)	55	(1)	80	(4)
6	(1)	31	(4)	56	(3)	81	(3)
7	(4)	32	(2)	57	(4)	82	(1)
8	(3)	33	(3)	58	(2)	83	(4)
9	(1)	34	(3)	59	(2)	84	(2)
10	(3)	35	(2)	60	(2)	85	(3)
11	(1)	36	(4)	61	(3)	86	(3)
12	(1)	37	(2)	62	(3)	87	(2)
13	(2)	38	(4)	63	(3)	88	(3)
14	(2)	39	(1)	64	(3)	89	(2)
15	(1)	40	(4)	65	(3)	90	(2)
16	(2)	41	(3)	66	(3)	91	(2)
17	(2)	42	(4)	67	(4)	92	(4)
18	(3)	43	(4)	68	(3)	93	(1)
19	(3)	44	(4)	69	(1)	94	(4)
20	(3)	45	(4)	70	(2)	95	(4)
21	(2)	46	(4)	71	(3)	96	(3)
22	(2)	47	(1)	72	(2)	97	(3)
23	(1)	48	(4)	73	(3)	98	(2)
24	(3)	49	(2)	74	(2)	99	(1)
25	(2)	50	(3)	75	(2)	100	(4)

1. (4) According to the alphabetical order,
M = 13 and N = 14
So, M × N = 13 × 14
In the same way, F = 6 and R = 18
Hence, F × R = 6 × 18

2. (1) As,

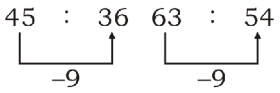


Similarly,

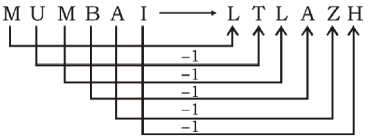


3. (2) As, 9 × 5 = 45 and 9 × 4 = 36
Similarly, 9 × 7 = 63 and 9 × 6 = 54

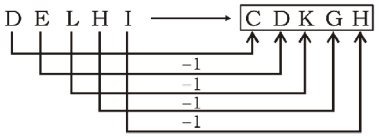
OR



4. (3) As,



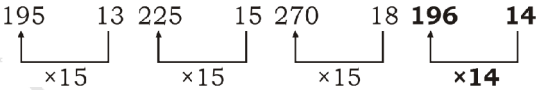
Similarly,



5. (4) A surgeon uses forceps, similarly, a blacksmith uses hammer.

6. (1) 55 × 5 = 275, 15 × 15 = 225
5 × 45 = 225, 25 × 9 = 225

7. (4)



8. (3) Except option (3), rest are the ancient names of India wheares Ajimabad is the ancient name of Patna.

9. (1) All other groups of letters except option (1) have (+2) series gap in each of them.

10. (3) Whiter, Worked, Worst, Wound, Writer

11. (1) The code contains the letters of the word in the order- third, fourth, second, fifth, first and sixth.

12. (1) 2 × 5 = 10, 10 × 3 = 30, 30 – 2 = 28
4 × 5 = 20, 20 × 3 = 60, 60 – 2 = 58

13. (2) Total number of digits
= (Number of digits in 1–digit page nos. + Number of digits in 2–digit page nos. + Number of digits in 3–digit page nos.)
= (1 × 9 + 2 × 90 + 3 × 267)
= (9 + 180 + 801) = 990

14. (2) Clearly, number of boys in the row = (6 + 10 + 8) = 24

15. (1) At 1 o'clock, the hour hand is at 1 and the minute hand is at 12. Thus, they are 5 min spaces apart. To be together, the minute hand must gain 5 min over the hour hand. 55 min. are gained by minute hand in 60 min.

5 min will be gained by it in $\left(\frac{60}{55}\times 5\right)$

$\text{min} = \frac{60}{11}\ \text{min} = 5\frac{5}{11}\ \text{min}$

Hence, the hands will coincide at $5\frac{5}{11}$ min past 1.

16. (2) 12 ÷ 2 + 9 – 4 = ?
6 + 9 – 4 = ?
15 – 4 = ?
∴ ? = 11

17. (2) B C E G K M Q
2 3 5 7 11 13 17

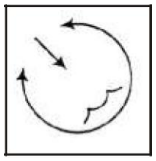
18. (3)

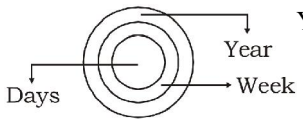
18	100	294	648	1210
↓	↓	↓	↓	↓
$3^3 - 3^2$	$5^3 - 5^2$	$7^3 - 7^2$	$9^3 - 9^2$	$11^3 - 11^2$
27	125	343	729	1331
−9	−25	−49	−81	−121
18	100	294	648	1210

19. (3) The sequence in first column is multiplied by 5.
Thus, $1 \times 5 = 5$, $5 \times 5 = 25$, $25 \times 5 = 125$
The sequence in third column is multiplied by 2.
Thus, $7 \times 2 = 14$, $14 \times 2 = 28$, $28 \times 2 = 56$
The sequence in second column is multiplied by 4.
$\therefore$ Missing number $= 12 \times 4 = 48$

20. (3) In the first column, $29 - 8 = 21 = 7 \times 3$
In the second column, $19 - 7 = 12 = 4 \times 3$
Let the missing number in the third column be x.
Then, $31 - 6 = 5 \times x$ or $5x = 25$ or $x = 5$

21. (2)

22. (2) 

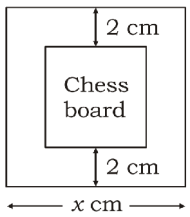
23. (1) 

Days

24. (3) $13 + 3 - 2 + 1 = 15$ or $17 - 2 = 15$

25. (2) Let son's age be x yr.
Then, father's age = (3x) yr
Five years ago, father's age = (3x – 5) yr
and son's age = (x – 5) yr
So, $3x - 5 = 4(x - 5)$
$\Rightarrow 3x - 5 = 4x - 20$
$\Rightarrow x = 15$ yr
$\therefore$ Son's age = 15 yrs

51. (1) Let the length of the side of the chess board be x cm.
Then
Area of 64 equal squares $= (x - 4)^2$
$\therefore (x - 4)^2 = 64 \times 6.25$
$\Rightarrow x^2 - 8x + 16 = 400$
$\Rightarrow x^2 - 8x - 384 = 0$
$\Rightarrow x^2 - 24x + 16x - 384 = 0$
$\Rightarrow (x - 24)(x + 16) = 0 \Rightarrow x = 24$ cm



Hence option (1) is true.

52. (2) Let the reservoir be filled by first pipe in x hours.
Then, second pipe will fill it in (x + 10) hr

$$\therefore \frac{1}{x} + \frac{1}{(x+10)} = \frac{1}{12}$$

$$\Rightarrow \frac{x + 10 + x}{x(x+10)} = \frac{1}{12}$$

$\Rightarrow x^2 - 14x - 120 = 0$
$\Rightarrow (x - 20)(x + 6) = 0$
$\Rightarrow x = 20$ [neglecting the –ve value of x]
So, the second pipe will take (20 + 10) hr i.e., 30 hr to fill the reservoir.

53. (2) Let the highest score be x.
Then, lowest score = (x – 150)
Then, $(50 \times 40) - [x + (x - 150)] = 38 \times 48$
$\Rightarrow 2x = 2000 + 150 - 1824$
$\Rightarrow 2x = 326$
$\Rightarrow x = 163$

54. (2) Let original income = ₹ 100
Then, expenditure = ₹ 75
and savings = ₹ 25
New income = ₹ 120

$$\text{New expenditure} = ₹\left(\frac{110}{100} \times 75\right) = ₹\frac{165}{2}$$

$$\text{New savings} = ₹\left(120 - \frac{165}{2}\right) = ₹\frac{75}{2}$$

$$\text{Increase in savings} = ₹\left(\frac{75}{2} - 25\right) = ₹\frac{25}{2}$$

$$\therefore \text{Increase \%} = \left(\frac{25}{2} \times \frac{1}{25} \times 100\right)\% = 50\%$$

55. (1) $5\tan\theta = 4 \Rightarrow \tan\theta = \frac{4}{5} = \frac{\text{Perpendicular}}{\text{Base}}$

$$\text{Now, } \frac{5\sin\theta - 3\cos\theta}{5\sin\theta + 3\cos\theta} = \frac{5\tan\theta - 3}{5\tan\theta + 3}$$

$$= \frac{5 \times \frac{4}{5} - 3}{5 \times \frac{4}{5} + 3} = \frac{1}{7}.$$

56. (3) Originally, let the number of boys and girls in the college be 7x and 8x respectively. Their increased numbers are (120% of 7x) and (110% of 8x).

$$\text{i.e. } \left(\frac{120}{100} \times 7x\right) \text{ and } \left(\frac{110}{100} \times 8x\right) \text{ i.e. } \frac{42x}{5} \text{ and } \frac{44x}{5}.$$

$$\therefore \text{Required ratio} = \frac{42x}{5} : \frac{44x}{5} = 21 : 22.$$

57. (1) Let the third proportional to $(x^2 - y^2)$ and $(x - y)$ be z.
Then $(x^2 - y^2) : (x - y) :: (x - y) : z$
$\Rightarrow (x^2 - y^2) \times z = (x - y)^2$

$$\Rightarrow z = \frac{(x-y)^2}{(x^2-y^2)} = \frac{(x-y)}{(x+y)}.$$

58. (2) Let the sum invested at 9% be ₹ x and that invested at 11% be ₹ (100000 – x)

$$\text{Then, } \left(\frac{x \times 9 \times 1}{100}\right) + \left[\frac{(10000-x)\times 11 \times 1}{100}\right]$$

$$= \left(100000 \times \frac{39}{4} \times \frac{1}{100}\right)$$

$$\Rightarrow \frac{9x + 1100000 - 11x}{100} = \frac{39000}{4} = 9750$$

$\Rightarrow 2x = (1100000 - 975000) = 125000$
$\Rightarrow x = 62500$
$\therefore$ Sum invested at 9% = ₹ 62,500
Sum invested at 11% = ₹ (100000 – 62500) = ₹ 37,500

59. (2) sin 38° cosec 142° + cos 35° . sec 145°
= sin 38° . cosec (180° – 38°)
+ cos 35° . sec(180° – 35°)
= sin 38° . cosec 38° + cos 35° . (– sec 35°)

$$= \sin 38° \times \frac{1}{\sin 38°} + \cos 35° \times \frac{1}{\cos 35°}$$

= 1 – 1 = 0

60. (2) Total profit required = ₹ (42 × 18) = ₹ 756
Profit on 22 sarees = ₹ (460 + 144) = ₹ 604
Profit on 20 sarees = ₹ (756 – 604) = ₹ 152
Average profit on these sarees

$$= ₹ \left(\frac{152}{20}\right) = ₹ 7.60$$

61. (3) $$\frac{\frac{13}{4} - \frac{5}{6} \times \frac{4}{5}}{\frac{13}{3} \div \frac{1}{5} - \left(\frac{3}{10} + \frac{106}{5}\right)} - \left(\frac{3}{2} \times \frac{5}{3}\right)$$

$$= \frac{\frac{13}{4} - \frac{2}{3}}{\frac{13 \times 5}{3} - \left(\frac{3 + 212}{10}\right)} - \frac{5}{2} = \frac{\frac{39-8}{12}}{\frac{65}{3} - \frac{215}{10}} - \frac{5}{2}$$

$$= \frac{\frac{31}{12}}{\frac{650 - 645}{30}} - \frac{5}{2} = \frac{31}{12} \times \frac{30}{5} - \frac{5}{2}$$

$$= \frac{31}{2} - \frac{5}{2} = \frac{31-5}{2} = \frac{26}{2} = 13.$$

62. (3) Volume of the new cube = Sum of volumes of all five cubes

$$\therefore a^3 = a_1^3 + a_2^3 + a_3^3 + a_4^3 + a_5^3$$

$$\text{or, } a = \sqrt[3]{a_1^3 + a_2^3 + a_3^3 + a_4^3 + a_5^3}$$

$$= \sqrt[3]{9^3 + 6^3 + 3^3 + 3^3 + 1^3} \text{ cm}$$

$$= \sqrt[3]{729 + 216 + 27 + 27 + 1} \text{ cm} = \sqrt[3]{1000} \text{ cm} = 10 \text{ cm}$$

63. (3) 1 child's 1 day's work $= \frac{1}{12 \times 16} = \frac{1}{192}$;

1 adult's 1 days' work $= \frac{1}{8 \times 12} = \frac{1}{96}$

Work done in 3 days $= \left(\frac{1}{96} \times 16 \times 3\right) = \frac{1}{2}$

Remaining work $= \left(1 - \frac{1}{2}\right) = \frac{1}{2}$

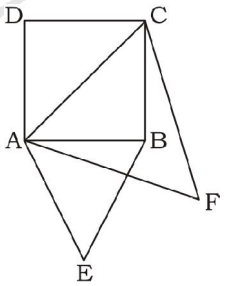
6 adults + 4 children's 1 days' work

$$= \left(\frac{6}{96} + \frac{4}{192}\right) = \frac{1}{12}$$

$\frac{1}{12}$ work is done by them in 1 day

$\frac{1}{2}$ work is done by them $\left(12 \times \frac{1}{2}\right)$ = 6 days.

64. (3)



Here $AC^2 = 2AB^2$
As ΔABE and ΔABC are equiangular
so $\Delta ABE \sim \Delta ABC$
[The ratio of the areas of two similar triangles is equal to the ratio of the square of their corresponding sides]

$$\frac{\text{area of } (\Delta ABE)}{\text{area of } (\Delta ACF)} = \frac{AB^2}{AC^2} = \frac{AB^2}{2AB^2} = \frac{1}{2}.$$

65. (3) Number of males = 60% of 1000 = 600
Number of females = (1000 – 600) = 400
Number of literates = 25% of 1000 = 250
Number of literate males = 20% of 600 = 120

Number of literate females = (250 – 120) = 130

$\therefore$ Required percentage $= \left(\frac{130}{400}\times 100\right)\% = 32.5\%.$

66. (3) Let the base of triangle be decreased by x%.
According to the question,

$10 - x - \frac{10x}{100} = 0$ [Area remains same]

$\Rightarrow x + \frac{x}{10} = 10 \Rightarrow \frac{10x + x}{10} = 10$

$\Rightarrow \frac{11x}{10} = 10 \Rightarrow x = \frac{100}{11} = 9\frac{1}{11}\%.$

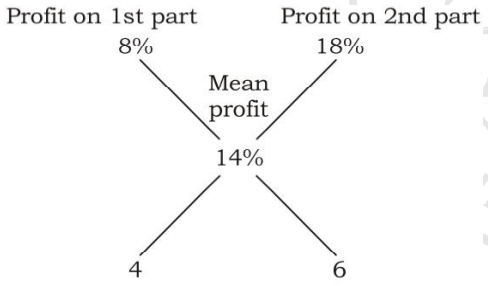
67. (1) Let cost price = ₹ 100

Then, $\frac{2}{5}$ of (Marked Price) = 75

$\Rightarrow$ Marked Price = ₹ $\left(\frac{75\times 5}{2}\right)$ = ₹ $\frac{375}{2}$

$\therefore$ Required ratio = $\frac{375}{2}:100 = 375 : 200 = 15 : 8$

68. (3) By the rule of alligation, we have:



Ratio of 1st and 2nd parts = 4 : 6 = 2 : 3

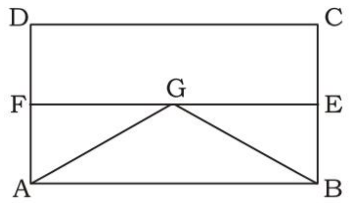
$\therefore$ Quantity of 2nd kind $= \left(\frac{3}{5}\times 1000\right)$ kg = 600 kg.

69. (1) Let the ratio be x : (x + 40)

Then, $\frac{x}{(x+40)} = \frac{2}{7}$

$\Rightarrow 7x = 2x + 80$
$\Rightarrow x = 16$
$\therefore$ Required ratio = 16 : 56

70. (2) AB || EF || CD. So ABEF is a rectangle



$\therefore \Delta AGB = \frac{1}{2}$ (area of rectangle ABEF)

$= \frac{1}{2}\times\left(\frac{1}{2}\text{ area of rectangle ABCD}\right)$

$= \frac{1}{4}$ (area of rectangle ABCD)

or, If a triangle and a parallelogram are on the same base and between the same parallels then the area of the triangle is equal to half the area of the parallelogram.

71. (3) Required percentage = $x + y + \frac{xy}{100}$

Here x = 50% (increase),
y = 50% (decrease) i.e., – 50%

$\Rightarrow$ Percentage = $50 - 50 - \frac{50\times 50}{100} = -25\%$

Hence there is 25% decrease in area.

72. (2) $\frac{(0.75)^3}{1-0.75} + [(0.75)^2 + 0.75\times 1 + 1]$

$= \frac{(0.75)^3 + (1-0.75)[(0.75)^2 + 0.75\times 1 + 1^2]}{1-0.75}$

$= \frac{(0.75)^3 + 1^3 - (0.75)^3}{0.25}$

$[\because (a-b)(a^2 + ab + b^2) = a^3 - b^3]$

$= \frac{1}{0.25} = \frac{100}{25} = 4$

$\therefore$ Square root = $\sqrt{4} = 2.$

73. (3) Remaining distance = 3 km

and Remaining time = $\left(\frac{1}{3}\times 45\right)$ min

$= 15$ min $= \frac{1}{4}$ hr.

$\therefore$ Required speed = (3 × 4) km/hr = 12 km/hr

74. (2) 50% of (x – y) = 30% of (x + y)

$\Rightarrow \frac{50}{100}(x-y) = \frac{30}{100}(x+y)$

$\Rightarrow 5(x-y) = 3(x+y) \Rightarrow 2x = 8y \Rightarrow x = 4y$
$\therefore$ Required percentage

$= \left(\frac{y}{x}\times 100\right)\% = \left(\frac{y}{4y}\times 100\right)\% = 25\%.$

75. (2) $\sin\theta$ and $\cos\theta$ are the roots of $ax^2 - bx + c = 0$

$$\therefore \sin\theta + \cos\theta = +\frac{b}{a} \qquad ...(1)$$

and $\sin\theta \cdot \cos\theta = +\frac{c}{a}$

Squaring the equation (1)

We get $(\sin\theta + \cos\theta)^2 = \left(\frac{b}{a}\right)^2$

$$\therefore \sin^2\theta + \cos^2\theta + 2\sin\theta\cos\theta = \frac{b^2}{a^2}$$

$$\therefore 1 + 2\times\left(\frac{c}{a}\right) = \frac{b^2}{a^2} \Rightarrow \frac{b^2}{a^2} - \frac{2c}{a} = 1$$

$$\therefore \frac{b^2 - 2ac}{a^2} = 1 \Rightarrow b^2 - 2ac = a^2$$

$\Rightarrow a^2 - b^2 + 2ac = 0$

76. (1) No error
77. (3) 'Responsible' will take 'for' after it, if it is followed by a noun.
86. (3) 'against' also means 'in contact with'.
87. (2) 'Enjoy' is followed by ' gerund'.
88. (3) Universal truth is mentioned in simple present tense.
89. (2) 'Do what I say' is a correct and meaningful sentence.
90. (2) The sentence is a reality of present time hence present indefinite tense is the appropriate tense to be used here.