

SSC CGL - 170733 GRAND TEST

HINTS AND SOLUTIONS

ANSWER KEY

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

- (4) Worm is the food of snake.
- (3) Dictionary contains words.
- (4) River contains flowing water. Similarly, pool contains stagnant water.
- (2) SH is the adjacent pair of IR.
- (2)
- (2)
- (4) All except Aluminum are magnetic metal.
- (1) Each of the numbers except 48, is one more than the square of a certain number.
- (2) $B > A > E, C > B, B > D > A, C > B > D > A > E$
- (3) Clearly, each word is coded by the numeral which is 1 less than the number of letters in the word.
- (4) Since, there are three Z's in consecutive order.

- (2) If 26th August in a year is Thursday. Hence, next Sunday is on 29th August. Hence total number of Sunday is 29, 22, 15, 8, 1.

- (4) Brother-in-law.

- (1)

- (4) L.C.M. of 54, 42 and 63

$$= 378 \text{ seconds} = \frac{378}{60} \text{ min} = 6 \frac{3}{10} \text{ min.}$$

- (2) $2187 \times \frac{1}{3} = 729; 729 \times \frac{1}{3} = 243;$

$$243 \times \frac{1}{3} = 81; 81 \times \frac{1}{3} = 27$$

$$27 \times \frac{1}{3} = 9; 9 \times \frac{1}{3} = 3$$

- (2) $4 = 2 \times 2$

$$18 = 3 \times 6$$

$$48 = 4 \times 12$$

$$100 = 5 \times 20$$

$$180 = 6 \times 30$$

$$294 = 7 \times 42$$

$$448 = 8 \times 56$$

- (3) Using the correct symbols, we have :

Given expression

$$= 26 \times 74 \div 5 + 2 = 26 \times \frac{37}{2} - 5 + 2$$

$$= 13 \times 37 - 5 + 2 = 481 - 5 + 2 = 478$$

- (4)

- (2)

- (2) Let number of 20 paise coins = x

Then, 25 paise coins = $324 - x$

$$\Rightarrow 0.2x + (324 - x) \cdot 0.25 = 71$$

$$\Rightarrow x = 200, \text{ so, } (324 - x) = 124 \text{ coins.}$$

- (3)

- (2)

- (3) We have:

$$(27 \div 3) + (16 \div 4) = 13; (42 \div 7) + (65 \div 13) = 11.$$

$$\text{So, missing number} = (27 \div 9) + (72 \div 8) = (3 + 9) = 12.$$

- (2)

- (4) Let $x = \sqrt{8 + 2\sqrt{8 + 2\sqrt{8 + 2\sqrt{8 + \dots}}}}$, then

$$x = \sqrt{8 + 2x}$$

Squaring both sides, we get

$$x^2 = 8 + 2x$$

$$\therefore x = 4$$

- (1)
$$\frac{(3.07)^2 + (0.0193)^2}{(0.307)^2 + (0.00193)^2} = \frac{(3.07)^2 + (0.0193)^2}{\left(\frac{3.07}{10}\right)^2 + \left(\frac{0.0193}{10}\right)^2}$$

$$= 100 \left[\frac{(3.07)^2 + (0.0193)^2}{(3.07)^2 + (0.0193)^2} \right] = 100$$

53. (2) Men to be arranged = $(6000 - 71) = 5929$
 Number of men arranged in each row
 $= \sqrt[3]{5929} = 77$

54. (2) $\sqrt{7} - \sqrt{5}, \sqrt{5} - \sqrt{3}, \sqrt{9} - \sqrt{7}, \sqrt{11} - \sqrt{9}$
 On rationalizing each term
 $= \frac{2}{\sqrt{7} - \sqrt{5}}, \frac{2}{\sqrt{5} - \sqrt{3}}, \frac{2}{\sqrt{9} - \sqrt{7}}, \frac{2}{\sqrt{11} - \sqrt{9}}$

Smallest denominator = $\sqrt{5} + \sqrt{3}$

So largest value = $\sqrt{5} - \sqrt{3}$

55. (3) 1000 is not a perfect square so we need to make perfect square.

	32
3	10000
3	9
62	100
2	124
	24

We need 24 more plants.

56. (1) $57^{25} - 1 = 7^1 - 1 = 6$ [$\because 25 = 4 \times 6 + 1$]

57. (1) I no. \times II no. = L.C.M. \times H.C.F.
 $(x^2 + 2x - 3) \times P = (x^3 + 7x + 6) \times (x + 3)$
 $\Rightarrow P = \frac{(x^2 + 7x + 6)(x + 3)}{x^2 + 2x - 3}$

$\Rightarrow P = (x + 3)(x - 2) = x^2 + x - 6$

58. (2) Average age of the couple is 25 years.
 The sum = $2 \times 25 = 50$ years
 After 3 years, sum = $50 + 2 \times 3 = 56$ years
 Age of baby = 2 years

The average = $\frac{56 + 2}{3} = \frac{58}{3} = 19\frac{1}{3}$ years

59. (3) Let minors be x.
 Consumption by adults = $8 \times 15 = 120$
 Total Consumption = $(x + 8) \times 10.8$
 Average consumption by minor

$= \frac{(8 + x)10.8 - 120}{x} = 6$

$\Rightarrow x = 7$

60. (3) Sum of 8 numbers = $20 \times 8 = 160$

$\left(15\frac{1}{2}\right) \times 2 + \left(21\frac{1}{3}\right) \times 3 + x + x + x + 4 + x + 7 = 160$

$\Rightarrow 31 + 64 + 3x + 11 = 160 \Rightarrow 3x = 160 - 106$

$\Rightarrow x = \frac{54}{3} \Rightarrow x = 18$

8th number = $x + 7 = 18 + 7 = 25$

61. (1) Students failed in Hindi = $100\% - 80\% = 20\%$
 Students failed in mathematics = $100\% - 75\% = 25\%$
 Students failed in both subjects = 18%
 Students passed in both subjects
 $= 100 - (25 + 20 - 18) = 73\%$
 Let total students be x.

$\Rightarrow \frac{x \times 73}{100} = 438 \Rightarrow x = 600$

Total students is 600.

62. (4) Let the total number of voters be x.

Number of votes cast in the election = $\frac{92}{100}x$

Number of votes obtained by winner = $\frac{48}{100}x$

Number of votes obtained by the defeated candidate

$= \frac{(92 - 48)}{100}x = \frac{44}{100}x$

From question, $\frac{48x}{100} - \frac{44x}{100} = 1100$

$\Rightarrow 4x = 110000 \Rightarrow x = 27500$

Total number of voters = 27,500.

63. (3) According to the question, let the number are a and b.

$(a - b) : (a + b) : ab = 1 : 7 : 24$

Numbers are $a = 8, b = 6$

So product = $8 \times 6 = 48$

64. (1) Let the length of candle be 1.

Rate of burn of first candle = $\frac{1}{4}$ per hour

The rate of burn of second candle = $\frac{1}{3}$ per hour

Let after x hour the ratio be 2 : 1.

$\Rightarrow \frac{4 - x}{4} = 2 \left(\frac{3 - x}{3} \right)$

$\Rightarrow x = 2\frac{2}{5}$ hours = 2 hours 24 min.

65. (1) Cost of raw material = 4x

Cost of labour = 3x

Cost of miscellaneous = 2x

The total cost = $4x + 3x + 2x = 9x$

Amount = $\frac{4x \times 110}{100} + \frac{3x \times 108}{100} + \frac{2x \times 95}{100}$

Percentage rise = $\frac{9.54x - 9x}{9x} \times 100 = 6\%$

66. (4) Given,

Total earning of A + B + C = 760000 ... (1)

Percentage of their saving are 30%, 25% and 20% respectively.

Let, savings of A, B and C be 4x, 5x and 6x respectively.

Now, 30% of A = 4x

$$\text{or, } 30 \times \frac{A}{100} = 4x \Rightarrow A = \frac{40}{3}x \quad \dots(2)$$

Also, 25% of B = 5x

$$\text{Or, } 25 \times \frac{B}{100} = 5x \Rightarrow B = 20x \quad \dots(3)$$

Also, 20% of C = 6x

$$\text{Or, } 20 \times \frac{C}{100} = 6x \Rightarrow C = 30x \quad \dots(4)$$

On using (2), (3) and (4) in (1), we get

$$\frac{40x}{3} + 20x + 30x = 76000 \Rightarrow x = 1200$$

$$\therefore A = \frac{40x}{3} = \frac{40}{3} \times 1200 = 16000$$

$$B = 20x = 20 \times 1200 = 24000$$

$$C = 30x = 30 \times 1200 = 36000$$

$$\therefore (A + B) - C = (16000 + 24000) - 36000 = \text{Rs.}4000.$$

67. (3) Let money be P.

$$\frac{P \times 12 \times 4}{100} - \frac{P \times 15 \times 5}{100} = 1890$$

$$\Rightarrow \frac{27P}{100} = 1890 \Rightarrow P = \frac{1890 \times 100}{27} = \text{Rs.}7000$$

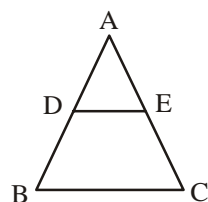
68. (1) Let initial amount = Rs. x

$$\frac{x}{3} \times \frac{7 \times 2}{100} + \frac{2}{5} \times \frac{x \times 10 \times 2}{100} + \frac{4 \times x \times 12 \times 2}{15 \times 100} = 1430$$

$$\Rightarrow \frac{14x}{300} + \frac{4x}{50} + \frac{8x}{125} = 1430$$

$$\Rightarrow x = \frac{1430 \times 750}{143} = \text{Rs.}7500$$

69. (4) DE || BC (given)



Since $\triangle ADE$ and $\triangle ABC$ are similar

$$\frac{\text{ar}(\triangle ADE)}{\text{ar}(\triangle ABC)} = \left(\frac{AD}{AB}\right)^2 \Rightarrow \sqrt{\frac{1}{2}} = \frac{AD}{AB}$$

$$\Rightarrow \frac{AD}{AB} = \sqrt{\frac{1}{2}} \Rightarrow \frac{AD}{BD} = \frac{1}{\sqrt{2}-1}$$

70. (3) Length of the common tangent = $\sqrt{a^2 - (6+3)^2}$

$$\therefore 8 = \sqrt{a^2 - (6+3)^2}$$

$$\text{or, } a^2 = 64 + 81 = 145 \Rightarrow a = \sqrt{145} \text{ cm}$$

$$\text{Distance between their centres} = \sqrt{145} \text{ cm}$$

71. (3) Since the sum of any two sides of a triangle is greater than the 3rd side.

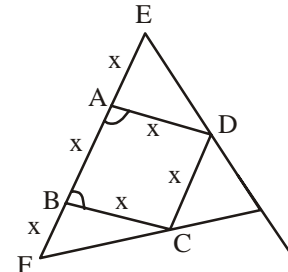
$2 + 3 > 5$, which is wrong.

$2 + 3 > 6$, which is wrong.

$\therefore (2, 3, 5)$ or $(2, 3, 6)$ will not form a triangle.

Triplets $(3, 5, 6)$ and $(2, 5, 6)$ are true for the sides of a triangle = 2 triangles.

72. (3)



In $\triangle ADE$, $AE = AB \Rightarrow AE = AD$

$$\therefore \angle E = \angle D = \theta \text{ (say)} \Rightarrow \angle A = \theta + \theta = 2\theta$$

Similarly, In $\triangle BCE$, $BE = BC \Rightarrow BF = BC$

$$\angle C = \angle F = \phi \text{ (say)} \Rightarrow \angle B = 2\phi$$

In rhombus ABCD, $\angle A = \angle B = 180^\circ$

$$\Rightarrow 2\theta + 2\phi = 180^\circ \Rightarrow \theta + \phi = 90^\circ$$

$$\therefore \angle EOF = 90^\circ \Rightarrow ED \perp CF$$

$$l \cos^2 \theta + m \sin^2 \theta = \frac{\cos^2 \theta (1 + \sin^2 \theta)}{\cot^2 \theta \sin^2 \theta}$$

$$\Rightarrow l \cos^2 \theta + \cos^2 \theta - m \cos^2 \theta = 2 - m$$

$$\Rightarrow \cos^2 \theta = \frac{2-m}{1-m+1} \text{ or } \sec^2 \theta = \frac{l-m+1}{2m}$$

$$\text{Or, } \tan^2 \theta = \frac{l-1}{2-m} \Rightarrow \tan \theta = \sqrt{\frac{l-1}{2-m}}$$

74. (2) Rate of processing cost of water for industrial, energy and domestic usage = 3 : 5 : 2

In 2006, water usage for industrial, energy and domestic = 25, 26 and 16 litres

In 2009, water usage for industrial, energy and domestic = 49, 35, 30 trillion litres

\therefore Ratio of processing cost for above mentioned usage in 2006 to that in 2009

$$= \frac{25 \times 3 + 26 \times 5 + 35 \times 2}{49 \times 3 + 35 \times 5 + 30 \times 2} = \frac{75 + 130 + 70}{147 + 175 + 60}$$

$$= \frac{275}{382} = 0.72$$

75. (1) Usage in energy related sector in 2006 = 26 trillion litres

Usage in energy related sector in 2009 = 35 trillion litres

Required percentage increase

$$= \frac{35-26}{26} \times 100 = 34.6\%$$