

SSC CHSL - CHT1 : 180226 GRAND TEST
HINTS AND SOLUTIONS

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

- (1) The first two letters are written in reverse order in the second term. The third letter is replaced by a letter occupying the same position from the end of the alphabet.
- (2) As, $9 \times 5 = 45$ and $9 \times 4 = 36$
Similarly, $9 \times 7 = 63$ and $9 \times 6 = 54$
OR

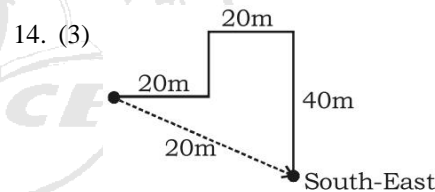
45	:	36	63	:	54
└───┬───┘		└───┬───┘			
-9		-9			
- (4) A surgeon uses forceps, similarly, a blacksmith uses hammer.
- (2) A vamp is part of a shoe, and a hood is part of a car.
- (3) Loss of memory is referred to as Amnesia.
Similarly, loss of movement is referred to as Paralysis.
- (2) All except (2) are insects having six legs.

1

- (3) In all other pairs the ratios is 8 : 9.
- (2) Except Nagpur, all are north indian cities.
- (3) Except option (3), rest are the ancient names of India wheares Ajimabad is the ancient name of Patna.
- (4) The letter 'V' of REPRIEVE is not present in DEPRECIATE.
- (2) A 'tractor' is used to plough a field.
But a 'tractor' is called 'car'.
So, a 'car' will be used to plough a field.
- (4) After exchanging the signs we have,

$$\begin{aligned} \text{Given expression} &= \frac{(36 - 4) \div 8 - 4}{4 \times 8 - 2 \times 16 + 1} \\ &= \frac{(32 \div 8 - 4)}{(32 - 32 + 1)} = 0 \end{aligned}$$

- (4) $5 \times 8 = 28 \rightarrow 5 \times 8 = 40 \rightarrow 5 + 8 = 13$,
 $13 - 1 = 12 \rightarrow 40 - 12 = 28$
 $3 \times 7 = 12 \rightarrow 3 \times 7 = 21 \rightarrow 3 + 7 = 10$,
 $10 - 1 = 9 \rightarrow 21 - 9 = 12$
 $8 \times 6 = 35 \rightarrow 8 \times 6 = 48 \rightarrow 8 + 6 = 14$,
 $14 - 1 = 13 \rightarrow 48 - 13 = 35$
 $13 \times 13 = ? \rightarrow 13 \times 13 = 169 \rightarrow 13 + 13 = 26$,
 $26 - 1 = 25 \rightarrow 169 - 25 = 144$



It is clear from the diagram that I am in south-east direction with respect to the original position.

- (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.)
= $(1 \times 9 + 2 \times 90 + 3 \times 267)$
= $(9 + 180 + 801) = 990$
- (4) $12 \times 2 + 3 = 27$; $27 \times 3 + 4 = 85$;
 $85 \times 4 + 5 = 345$; $345 \times 5 + 6 = 1731$
- (2) B C E G K M Q
2 3 5 7 11 13 17
- (2) $8 + 7 = 15$ and $2 \times 15 = 30$
 $1 + 7 = 8$ and $3 \times 8 = 24$
 $6 + 12 = 18$ and $2 \times 18 = 36$
- (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. (2) According to Rahul, the brother's birthday is on one of the days among 16 th and 17 th February.

According to Soumya, the brother's birthday is on one of the days among 17 th and 18 th February.

Clearly, Rahul's brother's birthday is on the day common to both the above groups i.e., 17 th February.

Hence, the answer is (2).

21. (2) Some teachers may be writers and vice-versa.

22. (3) Let x and y be the ten's and unit's digits respectively of the numeral denoting the woman's age.

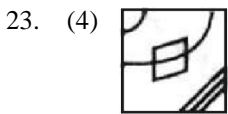
Then, woman's age = (10x + y) years;

husband's age = (10y + x) years.

Therefore (10y + x) - (10x + y) = (1/11) (10y + x + 10x + y)

$$\Rightarrow (9y - 9x) = (1/11) (11y + 11x) = (x + y)$$

$$\Rightarrow 10x = 8y \Rightarrow x/y = 4/5 \Rightarrow 10x + y = 10 \times 4 + 5 = 45$$



24. (1)

25. (2)

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

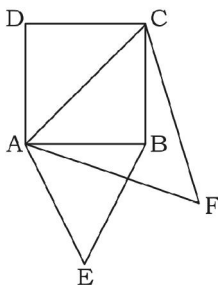
$$\therefore a^3 = a_1^3 + a_2^3 + a_3^3 + a_4^3 + a_5^3$$

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

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

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

52. (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]

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

53. (2) C.P. of 56 kg rice = ` (26 × 20 + 30 × 36)
= ` (520 + 1080) = ` 1600

S.P. of 56 kg rice = ` (56 × 30) = ` 1680

$$\therefore \text{Gain} = \left(\frac{80}{1600} \times 100 \right) \% = 5\%$$

54. (1) $2x + 3x + 5x = 180^\circ - 45^\circ = 135$

$$\Rightarrow 10x = 135^\circ$$

$$\Rightarrow x = \frac{135}{10} = \frac{27}{2}$$

$$\therefore \text{Largest angle} = 5x + 15^\circ = \left(5 \times \frac{27}{2} \right) + 15^\circ$$

$$= \frac{135 + 30}{2} = \frac{165^\circ}{2}$$

$$\therefore 180^\circ = \pi \text{ radian}$$

$$\therefore \frac{165^\circ}{2} = \frac{\pi}{180} \times \frac{165}{2} = \frac{11\pi}{24} \text{ radian}$$

55. (3)

	Tiger	:	Deer
leaps taken per minute	5	:	4
Distance covered per leap	8 m	:	5 m
Speed	→ 40 m/min	:	20 m/min
			↖ 20 m/min ↗

Both are running in the same direction, so relative speed = (40 - 20) = 20 m/min.

Actual distance between deer and tiger = 50 × 8 = 400 m

$$\text{Time taken by tiger to overtake deer} = \frac{400}{20} = 20 \text{ min}$$

Distance travelled by tiger in 20 min = 20 × 40 = 800 m

56. (3) Let no. of new pages be P_2 then,

$$30 \times 25 \times 35 = P_2 \times 30 \times 28 \Rightarrow P_2 = \frac{125}{4} = 31.25$$

$\Rightarrow P_2 = 32$ pages (pages will always be integers)

$$\text{So, Required percentage} = \frac{2}{30} \times 100 = 6.66\%$$

57. (4) Ratio of initial investments

$$= \left(\frac{7}{2} : \frac{4}{3} : \frac{6}{5} \right) = 105 : 40 : 36.$$

Let the initial investments be 105x, 40x and 36x.

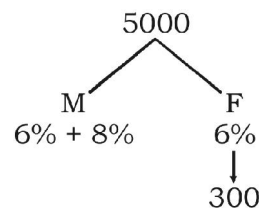
$$\therefore A : B : C = \left(105x \times 4 + \frac{150}{100} \times 105x \times 8 \right)$$

$$: (40x \times 12) : (36x \times 12)$$

$$= 1680x : 480x : 432x = 35 : 10 : 9$$

$$\text{Hence, B's share} = \left(21600 \times \frac{10}{54} \right) = ` 4000$$

58. (4)



$$8\% = 200$$

Total no. of females = 2500

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

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

$$\Rightarrow 7x = 2x + 80$$

$$\Rightarrow x = 16$$

\therefore Required ratio = 16 : 56

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

Here $x = 50\%$ (increase),

$y = 50\%$ (decrease) i.e., -50%

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

Hence there is 25% decrease in area.

61. (4) C.P. of 100 oranges = ` 350; S.P. of 12 oranges = ` 48

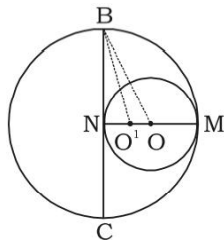
$$\therefore \text{S.P. of 100 oranges} = \frac{48}{12} \times 100 = ` 400$$

$$\therefore \text{profit \%} = \frac{400 - 350}{350} \times 100 = \frac{100}{7} = 14\frac{2}{7}\%$$

62. (1) OM = 4 cm = radius of smaller circle and O'M = 6 cm = radius of bigger circle

$$\therefore \text{O'N} = 8 - 6 = 2 \text{ cm}$$

In $\Delta \text{O'NB}$,



$$(\text{O'B})^2 = (\text{O'N})^2 + (\text{BN})^2$$

$$\Rightarrow (\text{BN})^2 = 36 - 4 = 32$$

$$\Rightarrow \text{BN} = 4\sqrt{2}$$

$$\therefore \text{NC} = \text{BN} = 4\sqrt{2}$$

$$\therefore \text{BC} = 4\sqrt{2} + 4\sqrt{2} = 8\sqrt{2} \text{ cm}$$

63. (3) Let total no. of voting list = $100x$

Total votes polled = $90x$

Valid votes = $90x - 1200$

Winner gets votes = $68x$

So, loser gets votes = $(90x - 1200) - 68x = 22x - 1200$

So, according to the question,

$$68x - (22x - 1200) = 56400$$

$$46x + 1200 = 56400$$

$$46x = 56400 - 1200$$

$$x = \frac{55200}{46}$$

Votes in favour of losing candidate

$$= 22 \times \frac{55200}{46} - 1200 = 25200$$

64. (1) $15\% = \frac{3}{20}, 10\% = \frac{1}{10}, 5\% = \frac{1}{20}$

Actual	Remain
20	17
10	9
20	19
4000	2907
↓ ×5	↓ ×5
20,000	14535

65. (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 = $\sqrt{4} = 2$.

66. (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

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

67. (4) $\sin 720^\circ - \cot 270^\circ - \sin 150^\circ \cdot \cos 120^\circ$

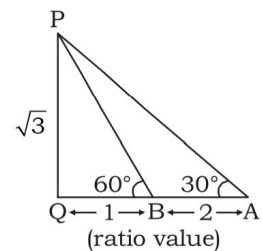
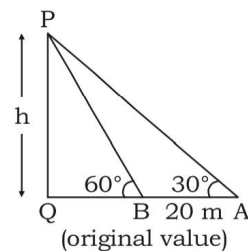
$$= \sin(2 \times 360^\circ + 0^\circ) - \cot(360^\circ - 90^\circ)$$

$$- \sin(90^\circ + 60^\circ) \cdot \cos(90^\circ + 30^\circ)$$

$$= \sin 0^\circ - \cot 90^\circ + \cos 60^\circ \cdot \sin 30^\circ$$

$$= 0 - 0 + \left(\frac{1}{2} \times \frac{1}{2} \right) = \frac{1}{4}$$

68. (3)



PQ = Tower = h metre (let)

Ratio value Original value

$$\text{AB} \rightarrow 2 \quad \longrightarrow \quad 20$$

$$\therefore 1 \quad \longrightarrow \quad 10$$

$$\therefore \sqrt{3} \quad \longrightarrow \quad 10\sqrt{3}$$

i.e. height of the tower = h (ratio value = $\sqrt{3}$)

$$= 10\sqrt{3} \text{ metre.}$$

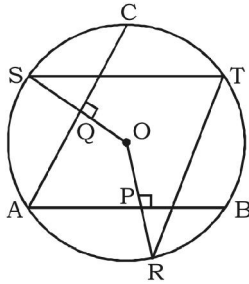


69. (3) Area of the base = $40 \times 40 = 1600 \text{ cm}^2$
 We know, Volume of pyramid

$$= \frac{1}{3} \times \text{area of base} \times \text{height}$$

$$\Rightarrow 8000 = \frac{1}{3} \times 1600 \times h \Rightarrow h = \frac{8000 \times 3}{1600} = 15 \text{ cm}$$

70. (2)



$\angle OQA = \angle OPA = 90^\circ$
 $\angle QOP + \angle QAP = 180^\circ$
 $\Rightarrow \angle QOP = \angle SOR = 2 \angle STR$
 $\Rightarrow \angle QOP = \angle SOR = 2 \angle STR$

$$\therefore \angle RTS = \frac{148}{2} = 74^\circ$$

71. (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

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

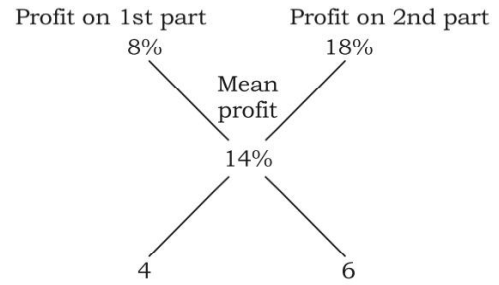
72. (1) Let cost price = ` 100

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

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

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

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



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

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

74. (1) $\cos(180^\circ + A) + \cos(180^\circ + B) + \cos(180^\circ + C) + \cos(180^\circ + D)$
 $= -\cos A - \cos B - \cos C - \cos D$
 $= -\cos(180^\circ - C) - \cos(180^\circ - D) - \cos C - \cos D$
 [∵ $A + C + B + D = 180^\circ$ cyclic quadrilateral]
 $= \cos C + \cos D - \cos C - \cos D$
 $= 0$

75. (1) $(3a + 1)^2 + (b - 1)^2 + (2c - 3)^2 = 0$
 On comparison, we get
 $(3a + 1) = 0 \Rightarrow 3a = -1$
 $(b - 1) = 0 \Rightarrow b = 1$
 $(2c - 3)^2 = 0 \Rightarrow 2c = 3$
 Now, $(3a + b + 2c) = -1 + 1 + 3 = 3$