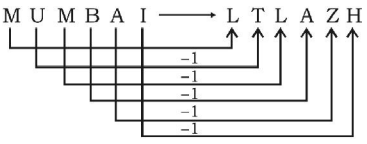
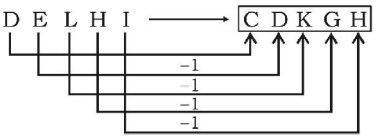
SSC CHSL - CHT1 : 180224 GRAND TEST HINTS AND SOLUTIONS

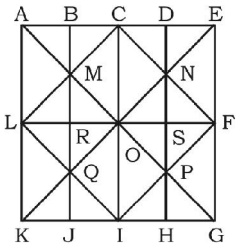
1	(3)	26	(4)	51	(3)	76	(2)
2	(4)	27	(3)	52	(2)	77	(3)
3	(4)	28	(1)	53	(2)	78	(2)
4	(4)	29	(4)	54	(4)	79	(3)
5	(3)	30	(3)	55	(4)	80	(3)
6	(4)	31	(3)	56	(2)	81	(3)
7	(4)	32	(1)	57	(3)	82	(4)
8	(4)	33	(4)	58	(2)	83	(2)
9	(1)	34	(1)	59	(2)	84	(1)
10	(4)	35	(3)	60	(3)	85	(3)
11	(3)	36	(4)	61	(1)	86	(1)
12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

1. (3) Second can be obtained by moving 135° in clockwise direction from first.
2. (4) $\frac{18\times18}{2}=\frac{324}{2}=162$; Similarly, $\frac{36\times36}{2}=\frac{1296}{2}=648$
3. (4) A bracelet is worn around the wrist, and a belt is worn around the waist.
4. (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
5. (3) As, 

   Similarly,


6. (4) All except Chocolate are baked items.
7. (4) The scientific study of the second is called the first in all the pairs except D.
8. (4) 5 + 2 = 7, 6 + 3 = 9, 2 + 4 = 6; But 3 + 5 = 8 ? 6
9. (1) 55 × 5 = 275, 15 × 15 = 225
   5 × 45 = 225, 25 × 9 = 225
10. (4) Let number of horses = number of men = x.
    Then, number of legs = $4x + 2 \times \frac{x}{2} = 5x$.
    So, 5x = 90 or x = 18
    So, there are (18 + 18) = 36 horses and men in total.
11. (3) The sequence is-
    1 × 2, 2 × 3, 3 × 4, 4 × 5, 5 × 6, 6 × 7, 7 × 8, 8 × 9.
    So, required answer = 8 × 9 = 72
12. (4) a **b** c / **c** b a / a b **c** / c b **a**
13. (4) Suppose present age of Mrs. Lata = x years
    Present age of son = y years;
    ∴ x + y = 64 ...(1)
    According to the question, x – 8 = 3 (y – 8)
    ∴ x – 8 = 3y – 24 ⇒ x – 3y = – 16 ...(2)
    From equations (1) and (2), y = 20;
    ∴ Age of Mrs. Lata = 64 – 20 = 44 years
14. (1) The code contains the letters of the word in the order- third, fourth, second, fifth, first and sixth.
15. (1) 2 × 5 = 10, 10 × 3 = 30, 30 – 2 = 28
    4 × 5 = 20, 20 × 3 = 60, 60 – 2 = 58
16. (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 $\left(\frac{60}{55}\times5\right)$
    min = $\frac{60}{11}$ min = $5\frac{5}{11}$ min
    Hence, the hands will coincide at $5\frac{5}{11}$ min past 1.
17. (3) In the first column, 29 – 8 = 21 = 7 × 3
    In the second column, 19 – 7 = 12 = 4 × 3
    Let the missing number in the third column be x.
    Then, 31 – 6 = 5 × x or 5x = 25 or x = 5
18. (1) $(7)^2 + (5)^2 + (3)^2 = 49 + 25 + 9 = 83$
    $(6)^2 + (4)^2 + (2)^2 = 36 + 16 + 4 = 56$
    $(8)^2 + (9)^2 + (1)^2 = 64 + 81 + 1 = 146$

19. (2)



The horizontal lines are AK, BJ, CI, DH and EG i.e. 5 in number.
The vertical lines are AE, LF and KG i.e. 3 in number.
The slanting lines are LC, CF, FI, LI, EK and AG i.e. 6 in number.
Thus, we require 5 + 3 + 6 = 14 straight lines to make the given figure.

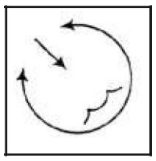
20. (4) Clearly, the last train left two and a half hours before 18:00 hours i.e. at 15:30 hours. But this happened 40 minutes before the announcement. So, the announcement was made at 16 : 10 hours.

21. (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

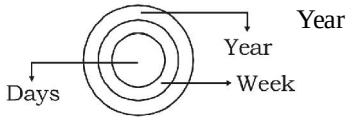
22. (4) Comparing (i) and (iii) dice we have,

Top	3	**2**	1
Bottom	4	**5**	6

23. (2)



24. (1)



25. (3)

51. (3) Let the distance travelled by x km.
Then,

$$\frac{x}{10}-\frac{x}{15}=2$$

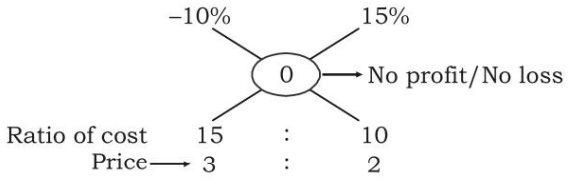
$\Rightarrow$ 3x – 2x = 60 $\Rightarrow$ x = 60 km
Time taken to travel 60 km at 10 km/hr

$$=\left(\frac{60}{10}\right)\text{hrs}=6\text{ hrs.}$$

So, Vivek started 6 hours before 2 P.M. i.e., at 8 A.M.

$$\therefore \text{ Required speed } =\left(\frac{60}{5}\right)\text{km/hr.}=12\,\text{km/hr.}$$

52. (2) Loss % = –10%, Profit % = 15%
By alligation Rule,



According to the question,
Let CP_1 = 300 units, CP_2 = 200 units

$$SP_1=\frac{300\times 90}{100}=270\text{ units};\ SP_2=\frac{200\times 115}{100}=230\text{ units}$$

Total SP = 270 + 230 = 500 units
500 units = ` 30,000 $\Rightarrow$ 1 unit = ` 60
100 units = ` 60 × 100 = ` 6000
Difference in cost prices = ` 6000

53. (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.

54. (4) $x=3+2\sqrt{2}$ and xy = 1

$$\Rightarrow y=\frac{1}{x}=\frac{1}{3+2\sqrt{2}}=3-2\sqrt{2}$$

$$\therefore x+y=3+2\sqrt{2}+3-2\sqrt{2}=6$$

Again, $\frac{x^2+3xy+y^2}{x^2-3xy+y^2}=\frac{(x+y)^2+xy}{(x+y)^2-5xy}=\frac{6^2+1}{6^2-5}=\frac{37}{31}$

55. (4) Let initial speed = 15 km/hr $\left[\because \frac{15\times 1}{15}=1\right]$
$\therefore$ Reduced speed = 15 – 1 = 14 km/hr
Time = 30 hours in both case.
$\therefore$ Distance (in case I) = 15 × 30 = 450 km
& Distance (in case II) = 14 × 30 = 420 km
$\therefore$ Difference = 450 – 420 = 30 km
But, the given difference = 10 km
$\therefore$ 30 $\rightarrow$ 10

$$\Rightarrow 1\rightarrow\frac{10}{30}=\frac{1}{3}\qquad \Rightarrow 15\rightarrow\frac{1}{3}\times 15=5$$

i.e., initial speed = 5 km/hr

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

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

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

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

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

57. (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).

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

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

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

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) Number of passengers after getting down and getting in at the first station = 240 – 12 + 22 = 250

Passengers left in the train after the second station

$=250-\frac{1}{5}\times 250=200$

Let x people get down at the third station then

According to the question,

$200+32-x=240\times\frac{80}{100}\Rightarrow 232-x=192\Rightarrow x=40$

60. (3) $\overrightarrow{\text{Bullets}}$ $\overrightarrow{\text{Train}}$

Distance covered in 45 seconds = 330 × 45 m

Required speed $=\frac{330\times 45}{11\times 60}\times\frac{18}{5}\text{ km/hr}=81\text{ km/hr}$

61. (1) Let the present ages of Sameer and Anand be 5x years and 4x years respectively.

Then, $\frac{5x+3}{4x+3}=\frac{11}{9}$

$\Rightarrow$ 9(5x + 3) = 11(4x + 3)

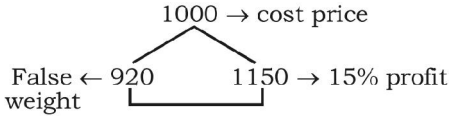
$\Rightarrow$ 45x + 27 = 44x + 33

$\Rightarrow$ 45x – 44x = 33 – 27

$\Rightarrow$ x = 6

$\therefore$ Anand's present age = 4x = 24 years.

62. (3)



$\therefore$ Required % $=\frac{230}{920}\times 100=\frac{2300}{92}=25\%$ profit

63. (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

64. (4) The total cost of truck for a year

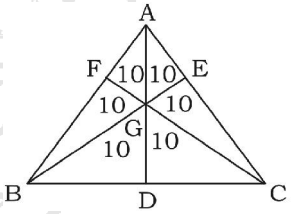
$=250000+\frac{250000\times 2}{100}+2000=\text{`}\,257000$

To get a return of 15% he must earn annualy

$=\frac{257000\times 15}{100}=\text{`}38550$

Hence, monthly rent $=\frac{38550}{12}=\text{`}3212.50$

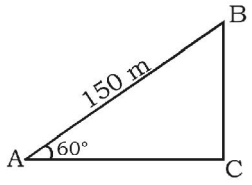
65. (3)



Total area of ΔABC = 60 cm 2

Hence the area of quadrilateral BDGF will be = 20 cm^2

66. (2)



AB = Length of the thread = 150 metre

$\angle$ BAC = 60°

In ΔABC,

$\sin 60°=\frac{BC}{AB}\Rightarrow\frac{\sqrt{3}}{2}=\frac{BC}{150}$

$\Rightarrow BC=150\times\frac{\sqrt{3}}{2}=75\sqrt{3}$ metre

67. (1) Speed of flowing water = 12 cm/s

Time = one hour = 3600 seconds

Quantity of water pumped out through pipe in one second $=\pi\times\left(\frac{7}{2}\right)^2\times 12\text{ cm}^3$

Total quantity in 1 hour

$= \pi \times \left(\frac{7}{2}\right)^2 \times 12 \times 3600\,cm^3$

$= \frac{22}{7} \times \frac{7 \times 7 \times 12 \times 3600}{4 \times 1000}\,l = 1663.2\,l$

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

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

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

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

69. (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

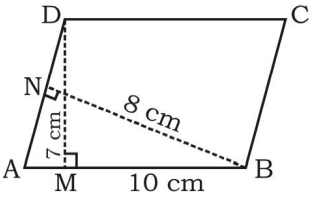
$\frac{1}{2}$ work is done by them $\left(12 \times \frac{1}{2}\right)$ = 6 days.

70. (4) Expression = (x – 2) (x – 9)

$= x^2 - 11x + 18 = ax^2 + bx + c$

Minimum value $= \frac{4ac - b^2}{4a} = \frac{4 \times 1 \times 18 - 121}{4} = \frac{-49}{4}$

71. (3)



Area of ||gm = Base × Height

$\therefore$ ar(||gm ABCD) = AB × DM = (10 × 7) cm^2 ...(i)

Also, ar(||gm ABCD) = AD × BN

= (AD × 8) cm^2 ...(ii)

From (i) and (ii), we have,

10 × 7 = AD × 8

$\Rightarrow AD = \frac{35}{4} = 8.75\,cm$

72. (2) $10\sin^4 A + 15\cos^4 A = 6$

$\Rightarrow 10\sin^4 A + 15 (1 - \sin^2 A)^2 = 6$

$\Rightarrow 10\sin^4 A + 15 + 15\sin^4 A - 30\sin^2 A = 6$

$\Rightarrow 25\sin^4 A - 30\sin^2 A + 9 = 0$

$\Rightarrow 25\sin^4 A - 15\sin^2 A - 15\sin^2 A + 9 = 0$

$\Rightarrow 5\sin^2 A (5\sin^2 A - 3) - 3 (5\sin^2 A - 3) = 0$

$\Rightarrow 5\sin^2 A - 3 = 0$

$\Rightarrow \sin^2 A = \frac{3}{5}$ $\quad \therefore \cos^2 A = \frac{2}{5}$

$\therefore$ $27\text{cosec}^6 A + 8\sec^6 A$

$= 27 \times \left(\frac{5}{3}\right)^3 + 8 \times \left(\frac{5}{2}\right)^3 = 27 \times \frac{125}{27} + 8 \times \frac{125}{8} = 125 + 125 = 250.$

73. (2) $\sin\theta + \text{cosec}\theta = 4 \Rightarrow \sin\theta + \frac{1}{\sin\theta} = 4$

let $\sin\theta = x$;

$x + \frac{1}{x} = 4$

$\therefore \sin\theta - \text{cosec}\theta = \left(x - \frac{1}{x}\right) - 2 \times \frac{1}{x} \times x$

$= x^2 + \frac{1}{x^2} - 2 = \left(x + \frac{1}{x}\right)^2 - 2 - 2 = (4)^2 - 4 = 16 - 4 = 12$

$\therefore \sin\theta - \text{cosec}\theta = \sqrt{12} = 2\sqrt{3}$

74. (3) Let the base of triangle be decreased by x%.

According to the question,

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

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

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

75. (3) $p + \frac{1}{4}\sqrt{p} + k^2 = (\sqrt{p})^2 + 2 \cdot \sqrt{p} \cdot \frac{1}{8} + \left(\frac{1}{8}\right)^2 - \left(\frac{1}{8}\right)^2 + k^2$

$\Rightarrow k^2 = \left(\frac{1}{8}\right)^2 \Rightarrow k = \pm\frac{1}{8}$