



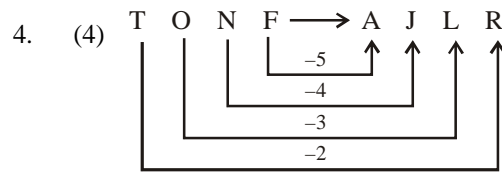
**SSC CHSL - CHT1 : 180230 GRAND TEST**  
**HINTS AND SOLUTIONS**

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

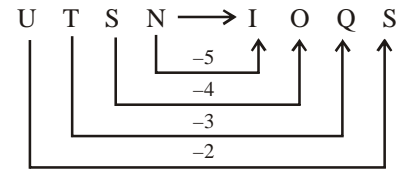
1. (3)  $A \xrightarrow{+3} D \xrightarrow{+4} H \xrightarrow{+5} M$   
 $Z \xrightarrow{-5} U \xrightarrow{-4} Q \xrightarrow{-3} N$   
 Similarly,  
 $G \xrightarrow{+2} I \xrightarrow{+2} K \xrightarrow{+2} M$   
 $T \xrightarrow{-2} R \xrightarrow{-2} P \xrightarrow{-2} N$

2. (2) Physics is related to science and History is related to Social science.

3. (1)  $78 \Rightarrow 7 \times 8 = 56 \Rightarrow \frac{56}{2} = 28$   
 $84 \Rightarrow 8 \times 4 = 32 \Rightarrow \frac{32}{2} = 16$



Similarly,



5. (2)  $8465 \Rightarrow 84 - 65 = 19$   
 $2643 \Rightarrow 43 - 26 = 17$   
 $4867 \Rightarrow 67 - 48 = 19$   
 $6243 \Rightarrow 62 - 43 = 19$
6. (1) Except PQRS, in others atleast one vowel is present.
7. (4) Director is different from the other three words.
8. (1)  $K \xrightarrow{+4} O \xrightarrow{+4} S \xrightarrow{+4} W$   
 $J \xrightarrow{+4} N \xrightarrow{+4} R \xrightarrow{+4} V$   
 $L \xrightarrow{+4} P \xrightarrow{+4} T \xrightarrow{+4} X$

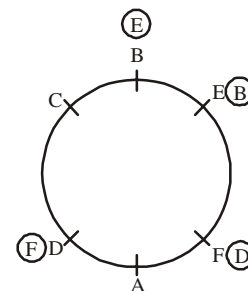
9. (4)  $8 + \frac{8}{2} = 12, 12 + \frac{12}{2} = 18, 18 + \frac{18}{2} = 27,$   
 $27 + \frac{27}{2} = 40.5.$

10. (4) Arrangement of words as per dictionary :

- (i) Forge  
 $\downarrow$   
 (ii) Forget  
 $\downarrow$   
 (iv) Forgive  
 $\downarrow$   
 (iii) Forgo  
 $\downarrow$   
 (v) Format

11. (2) The number '3' is common to all the three circles.  
 12. (4)  
 13. (4) Neither conclusion (1) nor (2) follows

14. (3)



Now, A is to the left of D.

15. (4)

	P	U	N	C	T	U	A	T	I	O	N
	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Q	V	O	D	U	V	B	U	J	P	O

	S	I	N	G
	+1	+1	+1	+1
	↓	↓	↓	↓
	T	J	O	H

Therefore,

	P	A	R	L	I	A	M	E	N	T
	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Q	B	S	M	J	B	N	F	O	U

16. (1) Obviously both the Conclusions follow. Food problem arises due to rapid increase in population.

17. (1)  $(1 \times 5) + (2 \times 3) \Rightarrow 5 + 6 = 11$   
 $(2 \times 2) + (3 \times 2) \Rightarrow 4 + 6 = 10$   
 Therefore,  $(4 \times 2) + (3 \times 6) \Rightarrow 8 + 18 = 26.$

18. (1)  $A = 1^2 + 1 = 2, B = 2^2 + 2 = 6, C = 3^2 + 3 = 12,$   
 $D = 4^2 + 4 = 20, E = 5^2 + 5 = 30, F = 6^2 + 6 = 42$  and  
 $G = 7^2 + 7 = 56$

then,  $F + B + G = 42 + 6 + 56 = 104$

19. (4) First Column  $12 \times 3 + 4 = 40$   
 Second Column  $15 \times 4 + 6 = 66$

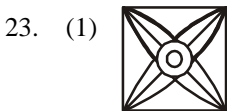
Third Column  $16 \times 5 + 4 = \boxed{84}$

20. (4) PQRS/PSQR/PRSQ/PQR

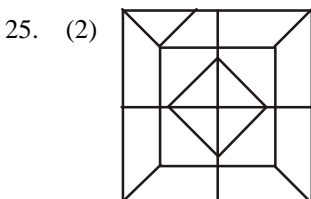
21. (2)  $6 \times 2 = 12 \Rightarrow 21$   
 $21 \times 2 = 42 \Rightarrow 24$   
 $24 \times 2 = 48 \Rightarrow 84$   
 $84 \times 2 = 168 \Rightarrow 861$   
 $861 \times 2 = 1722 \Rightarrow 2271$   
 $2271 \times 2 = 4542 \Rightarrow \mathbf{2454}$   
 $2454 \times 2 = 4908 \Rightarrow 8094$

22. (3)  $926 - 818 = 108; \frac{108}{4} = 27$

$703 - 639 = 64; \frac{64}{4} = 16$



24. (2)



51. (1)  $\tan 89^\circ = \tan (90^\circ - 1^\circ) = \cot 1^\circ$   
 $\tan 88^\circ = \tan (90^\circ - 2^\circ) = \cot 2^\circ$   
 $\therefore \tan 1^\circ \cdot \tan 2^\circ \cdot \tan 3^\circ \dots \tan 45^\circ \dots \tan 87^\circ \cdot \tan 88^\circ \cdot \tan 89^\circ = (\tan 1^\circ \cdot \cot 1^\circ) (\tan 2^\circ \cdot \cot 2^\circ) \dots \tan 45^\circ = 1$   
 $(\tan \theta \cdot \cot \theta = 1)$

52. (4) Let original income = ` 100  
 Then, expenditure = ` 75 and savings = ` 25  
 New income = ` 150;

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

New savings =  $\left( 150 - \frac{165}{2} \right) = \frac{135}{2}$

Increase in savings =  $\left( \frac{135}{2} - 25 \right) = \frac{85}{2}$

$\therefore$  Increase % =  $\left( \frac{85}{2} \times \frac{1}{25} \times 100 \right) \% = 170\%$

53. (1) (A+B)'s 1 day's work =  $\frac{1}{12} + \frac{1}{15} = \frac{5+4}{60} = \frac{3}{20}$

Work done by A in 6 days =  $6 \times \frac{1}{12} = \frac{1}{2}$

Remaining work =  $1 - \frac{1}{2} = \frac{1}{2}$

Time taken by (A + B) in doing half of work

=  $\frac{20}{3} \times \frac{1}{2} = \frac{10}{3} = 3\frac{1}{3}$  days

54. (3) Radius of cylinder = r units and height = r units

$\therefore$  Required ratio =  $2\pi r^2 + 2\pi r^2 : 2\pi r^2 + \pi r^2 = 4 : 3$

55. (2) Volume of sphere

=  $\frac{4}{3} \pi r^3 = \frac{4}{3} \pi \times 9 \times 9 \times 9 = 972 \pi$  cubic cm.

If the length of wire be h cm., then

$\pi \times (0.2)^2 \times h = 972 \pi$

$\Rightarrow h = \frac{972}{0.2 \times 0.2} = 24300 \text{ cm} = 243 \text{ metres}$

56. (1) If the marked price of a trouser be Rs. x then

$\frac{x \times 40}{100} = 320$

$\Rightarrow x = \frac{320 \times 100}{40} = \text{Rs. } 800$

$\therefore$  S. P. of trouser =  $\frac{800 \times 60}{100} = \text{Rs. } 480.$

57. (2) (P + Q)'s present age = 40 + 20 = 60 years  
 (P + Q + R)'s present age = 90 years  
 R's present age = 90 - 60 = 30 years  
 R's age after 10 years = 30 + 10 = 40 years.

58. (1) Volume of water flowing from the pipe in 1 minute  
 =  $\pi \times 0.25 \times 0.25 \times 1000$  cu. cm.

Volume of conical vessel  
 $= \frac{1}{3} \pi \times 15 \times 15 \times 24$  cu. cm.

$\therefore$  Required time =  $\frac{\pi \times 15 \times 15 \times 24}{3\pi \times 0.25 \times 0.25 \times 1000}$   
 = 28 minutes 48 seconds

59. (3) Let cost price = ` 100

Then,  $\frac{1}{3}$  of (Marked Price) = 80

$\Rightarrow$  Marked Price = ` 240

$\therefore$  Required ratio = 240 : 100 = 12 : 5.

60. (2) Product of numbers = 11  $\times$  385 = 4235

Let the numbers be 11a and 11b.

Then, 11a  $\times$  11b = 4235

$\Rightarrow$  ab = 35

Now, co-primes with product 35 are (1, 35) and (5, 7)

So, the numbers are (11  $\times$  1, 11  $\times$  35) and (11  $\times$  5, 11  $\times$  7)

Since one number lies between 75 and 125, the suitable pair is (55, 77)

Required number = 77.

Hence, Sum of the digits = 7 + 7 = 14

61. (2) Semi-perimeter of triangle

$= \frac{50 + 78 + 112}{2} = \frac{240}{2} = 120$ cm

Area of triangle

$= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{120(120-50)(120-78)(120-112)}$

$= \sqrt{120 \times 70 \times 42 \times 8} = 1680$  sq. cm.

$\therefore$  The altitude will be smallest when base is largest.

$\therefore \frac{1}{2} \times 112 \times h = 1680 \Rightarrow h = \frac{1680 \times 2}{112} = 30$  cm

62. (3) Total C. P. = Rs. 100 (100 articles)

Total S. P. =  $75 \times \frac{140}{100} + 25 \times \frac{60}{100} \times 1.4$

= 105 + 21 = Rs. 126.

Gain percent = Rs. 26.

63. (1)  $4 \tan^2 \theta + 9 \cot^2 \theta = (2 \tan \theta - 3 \cot \theta)^2 + 12$

$\therefore$  Minimum value = 12 because  $(2 \tan \theta - 3 \cot \theta)^2 \geq 0$

64. (4) Volume of the new cube = Sum of volumes of all five cubes

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

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

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

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

$\therefore$  Required Area =  $6 \times 10^2 = 600$  cm<sup>2</sup>

65. (4) Number of diagonals =  $\frac{6(6-3)}{2} = 9$ .

66. (2) Percentage decrease

$= \frac{r}{100+r} \times 100\% = \frac{25}{125} \times 100 = 20\%$

67. (2)  $\sec^2 12^\circ - \cot^2 78^\circ$

$= \sec^2 12^\circ - \cot^2 (90^\circ - 12^\circ)$

$= \sec^2 12^\circ - \tan^2 12^\circ = 1$

68. (2)  $x + y + z = a - b + b - c + c - a = 0$

$\therefore x^3 + y^3 + z^3 - 3xyz = 0$

69. (3)  $\cos \operatorname{cosec} \theta - \cot \theta = \frac{7}{2}$  ... (i)

$\cos \operatorname{cosec}^2 \theta - \cot^2 \theta = 1$

$\Rightarrow (\cos \operatorname{cosec} \theta + \cot \theta)(\cos \operatorname{cosec} \theta - \cot \theta) = 1$

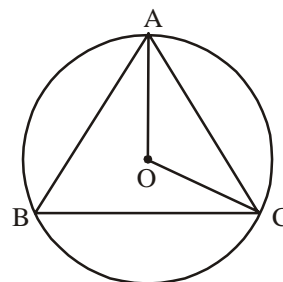
$\Rightarrow \cos \operatorname{cosec} \theta + \cot \theta = \frac{1}{\cos \operatorname{cosec} \theta - \cot \theta} = \frac{2}{7}$  ... (ii)

On addition both equations,

$2 \cos \operatorname{cosec} \theta = \frac{7}{2} + \frac{2}{7} = \frac{49+4}{14} = \frac{53}{14}$

$\Rightarrow \cos \operatorname{cosec} \theta = \frac{53}{28}$

70. (1)



$\angle ABC = 180^\circ - 85^\circ - 75^\circ = 20^\circ$

$\angle AOC = 40^\circ$

OA = OC

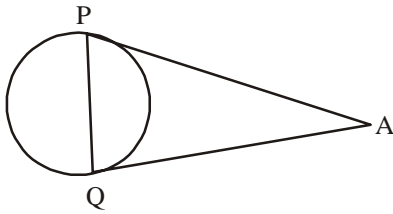
$\therefore \angle OAC = \angle OCA$

$\therefore \angle OAC + \angle OCA = 180^\circ - 40^\circ = 140^\circ$

$\therefore \angle OAC = 70^\circ$



71. (1)



$$AP = AQ$$

$$\therefore \angle APQ = \angle AQP$$

$$\therefore \angle APQ + \angle AQP = 180^\circ - 68^\circ = 112^\circ$$

$$\therefore \angle APQ = \frac{112}{2} = 56^\circ$$

72. (1)  $5 \tan \theta = 4 \Rightarrow \tan \theta = \frac{4}{5}$

Now,

$$\frac{7 \sin \theta - 4 \cos \theta}{7 \sin \theta + 4 \cos \theta} = \frac{7 \tan \theta - 4}{7 \tan \theta + 4} = \frac{7 \times \frac{4}{5} - 4}{7 \times \frac{4}{5} + 4} = \frac{\frac{28}{5} - 4}{\frac{28}{5} + 4} = \frac{\frac{28 - 20}{5}}{\frac{28 + 20}{5}} = \frac{8}{48} = \frac{1}{6}$$

73. (1) Required percentage Increase

$$= \left( \frac{9-4}{4} \times 100 \right) \% = 125\%$$

74. (2) Number of students getting at least 60% marks in Geography

Number of students getting 30 and above marks in Geography = 21

Number of students getting 20 and above marks in aggregate = 63

$$\text{Required percentage} = \left( \frac{21}{63} \times 100 \right) \% = 33.33\%$$

75. (2) Let the required percentage be x.

Then,  $80 - 80 \text{ off } x\% = 66$ 

$$\Rightarrow 80 - \frac{4x}{5} = 66 \Rightarrow \frac{4x}{5} = 14 \Rightarrow x = 17.5\%$$

 $\therefore$  Required percentage = 17.5%