SSC CHSL - CHT1 : 180234 GRAND TEST HINTS AND SOLUTIONS

ANSWER KEY

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

1. (1) Eagle swoops down on anything. The movement of eagle is like swooping. Similarly, the movement of duck is called waddke,

2. (1) A P P L E

$1 + 16 + 16 + 12 + 5 = 50$

Similarly,

O R A N G E

$15 + 18 + 1 + 14 + 7 + 5 = 60$

3. (4) Grenade and gun are firearms. Similarly, head and brain are sensitive organs.

4. (1) The relation is :
$x : x^2 + 1$
$4 : (4)^2 + 1 \Rightarrow 4 : 17$
Similarly,
$7 : (7)^2 + 1 \Rightarrow 7 : 50$.

5. (2) $428 \Rightarrow 4 \times 2 = 8$
$338 \Rightarrow 3 \times 3 = \boxed{9}$
$326 \Rightarrow 3 \times 2 = 6$
$339 \Rightarrow 3 \times 3 = 9$

6. (2) Except diesease, all other terms denote obstruction, hindrance or interruption.

7. (1) The difference between the two numbers in the number pair 6246 – 6296 is least.
6296 – 6246 = 50
7267 – 7137 = 130
4684 – 4344 = 340
5465 – 5235 = 230

8. (4) 112 is completely divisible by 4 $= \frac{112}{4} = 28$

$\Rightarrow \frac{132}{5} = 26.4; \frac{125}{8} = 15.625; \frac{124}{7} = 17.71$

9. (4) $A \xrightarrow{+2} C \xrightarrow{+2} E \xrightarrow{+2} \boxed{G}$
$Z \xrightarrow{-2} X \xrightarrow{-2} V \xrightarrow{-2} \boxed{T}$

10. (2)

$Y \xrightarrow{-1} X \xrightarrow{-3} U \xrightarrow{-1} T \xrightarrow{-1} S \xrightarrow{-4} O \xrightarrow{-1} N \xrightarrow{-1} M \xrightarrow{-1} L \xrightarrow{-5} G \xrightarrow{-1} F \xrightarrow{-1} E \xrightarrow{-1} D \xrightarrow{-1} C$

11. (2) $3 \xrightarrow{+7} 10 \xrightarrow{+7} \boxed{17}$
$5 \xrightarrow{+7} 12 \xrightarrow{+7} \boxed{19}$

$35 \longrightarrow 35 \longrightarrow 35$

12. (3) First Column 10 + 12 + 4 + 10 = 36

$\frac{36}{2} = 18$ (Lowermost number)

Second Column 11 + 12 + 12 + 5 =40

$\frac{40}{2} = 20$

Third Column 15 + 8 + 10 + 13 = 46

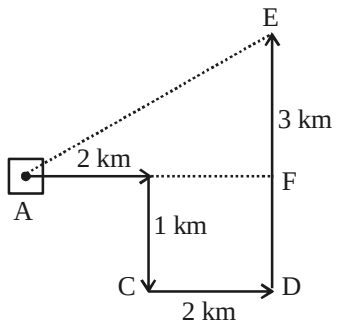
$\frac{46}{2} = \boxed{23}$

13. (1) First figure $(11 \times 12) - (6 \times 9) \Rightarrow 132 - 54 = 74$
Second figure $(14 \times 10) - (7 \times 8) \Rightarrow 140 - 56 = 84$

14. (2) P E A R
↓ ↓ ↓ ↓
G F D N

Therefore R E A P
↓ ↓ ↓ ↓
N F D G

15. (1)



Required distance AE

$= \sqrt{(AF)^2 + (EF)^2} = \sqrt{(4)^2 + (3)^2}$

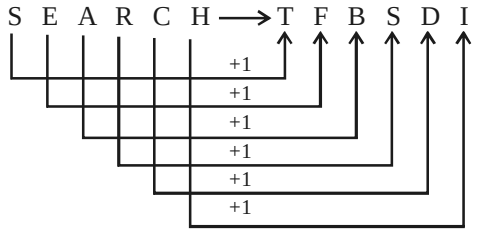
$= \sqrt{16+9} = \sqrt{25} = 5$ km

16. (1) $2 \times 3 \times 5 \times 4 = 120$
$120 \times 120 = 14400$

17. (1) $16 \Rightarrow (2 + 2)^2 = (4)^2$
$9 \Rightarrow (3 + 0)^2 = (3)^2$
$81 \Rightarrow (1 + 8)^2 = (9)^2$
Similarly, $64 \Rightarrow (4 + 4)^2 = (8)^2$

18. (1) Growth and development of human organism is a continuous process. Some changes take place in human body now and then. Therefore, neither Conclusion I nor II follows.

19. (3)



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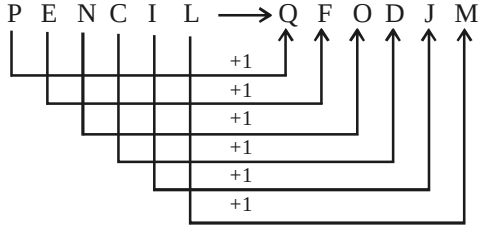
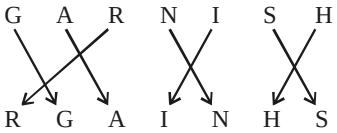


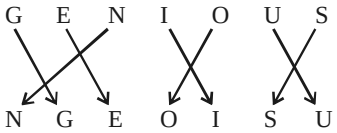
20. (1) $2.5 \times 4 + 40 \div 20 - 12$
$10 + 2 - 12 = 0$

21. (2) $A \xrightarrow{+2} C \xrightarrow{+2} E \xrightarrow{+2} G$
$I \xrightarrow{+1} J \xrightarrow{+2} L \xrightarrow{+1} M$
$O \xrightarrow{+2} Q \xrightarrow{+2} S \xrightarrow{+2} U$
$B \xrightarrow{+2} D \xrightarrow{+1} E \xrightarrow{+1} F$
$G \xrightarrow{+1} H \xrightarrow{+2} J \xrightarrow{+4} N$

22. (4)

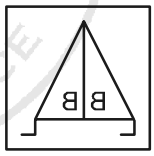


Similarly,



23. (3) Suppose the number of deer = d
And, number of peacocks = p
According to question $d + p = 80$ ....(i)
And, $4d + 2p = 200$
or, $2d + p = 100$ ....(ii)
From equation (i) and (ii)
$d = 20$
Therefore, number of peacocks = 80 – 20 = 60.

24. (4)



25. (2)

51. (3) Let amount invested in each company be Rs. x.

$$\text{S.I.} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

According to the question,

$$\frac{x \times 15 \times 5}{100} - \frac{x \times 12 \times 4}{100} = 1350$$

$$\Rightarrow \frac{75x}{100} - \frac{48x}{100} = 1350 \Rightarrow \frac{27x}{100} = 1350$$

$$\Rightarrow x = \frac{1350 \times 100}{27} = \text{Rs. } 5000$$

52. (3) $x = 4$
$\Rightarrow$ Equation of a line parallel to y-axis, $y = 3$
$\Rightarrow$ Equation of a line parallel to x-axis.
Putting $x = 0$ in the equation $3x + 4y = 12$,

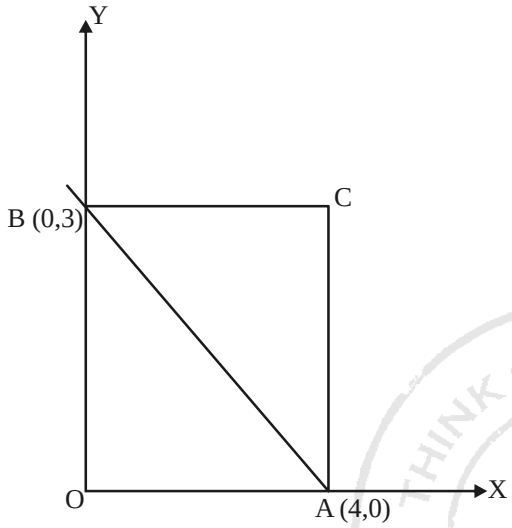
$$3 \times 0 + 4y = 12 \Rightarrow y = \frac{12}{4} = 3$$

∴ Co-ordinates of the point of intersection on y-axis = (0, 3)

Again putting y = 0 in the equaiton 3x + 4y = 12,

$3x + 4 \times 0 = 12 \Rightarrow x = \frac{12}{3} = 4$

∴ Co-ordinates of the point of intersection on x-axis = (4, 0).



AC = 3 units, BC = 4 units

∴ Area of ΔABC

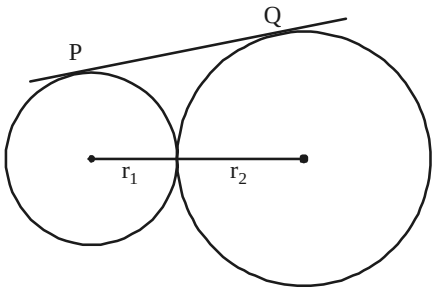
$= \frac{1}{2} \times BC \times AC = \frac{1}{2} \times 4 \times 3 = 6$ sq. units

53. (1) $39 + 48 + 51 + 63 + 75 + 83 + x + 69 = 60 \times 8$

$\Rightarrow 428 + x = 480$

$\Rightarrow x = 480 - 428 = 52.$

54. (4)



$r_1 + r_2 = 13$ cm

$r_2 - r_1 = 9 - 4 = 5$ cm

$PQ = \sqrt{(\text{distance between centres})^2 - (r_2 - r_1)^2}$

$= \sqrt{(13^2 - 5^2)} = 12$ cm.

∴ Area of square = 12 × 12 = 144 sq. cm.

55. (2) x = z = 225, y = 226

∴ x + y + z = 225 + 226 + 225 = 676

∴ $x^3 + y^3 + z^3 - 3xyz$

$= \frac{1}{2}(x+y+z)[(x-y)^2 + (y-z)^2 + (z-x)^2]$

$= \frac{1}{2} \times 676[(225-226)^2 + (226-225)^2 + (225-225)^2]$

$= \frac{1}{2} \times 676 \times (1+1) = 676$

56. (2) Expression $= 2b^2c^2 + 2c^2a^2 + 2a^2b^2 - a^4 - b^4 - c^4$

$= 4b^2c^2 - (2b^2c^2 - 2c^2a^2 - 2a^2b^2 + a^4 + b^4 + c^4)$

$= (2bc)^2 - (a^2 - b^2 - c^2)^2$

$= (2bc + a^2 - b^2 - c^2)(2bc - a^2 + b^2 + c^2)$

$= (a^2 - (b^2 + c^2 - 2bc))(b^2 + c^2 + 2bc - a^2)$

$= (a^2 - (b-c)^2)((b+c)^2 - a^2)$

$= (a - b + c)(a + b - c)(a + b + c)(b + c - a)$

If a + b – c = 0

∴ Expression = 0

57. (4) Expression

$= 3(\sin^4\theta + \cos^4\theta) + 2(\sin^6\theta + \cos^6\theta) + 12\sin^2\theta.\cos^2\theta$

$= 3\{(\sin^2\theta + \cos^2\theta)^2 - 2\sin^2\theta.\cos^2\theta\}$

$+2\{(\sin^2\theta + \cos^2\theta)^3 - 3\sin^2\theta.\cos^2\theta$

$(\sin^2\theta + \cos^2\theta)\} + 12\sin^2\theta.\cos^2\theta$

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

$= 3(1 - 2\sin^2\theta.\cos^2\theta) + 2(1 - 3\sin^2\theta.\cos^2\theta)$

$+12\sin^2\theta.\cos^2\theta$

$= 3 - 6\sin^2\theta.\cos^2\theta + 2 - 6\sin^2\theta\cos^2\theta + 12\sin^2\theta.\cos^2\theta$

= 5

58. (2) Let the average cost of each book bought (of 64 books) be Rs. x.

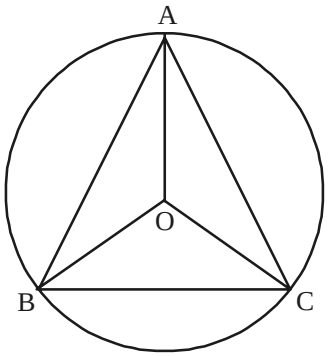
According to the question, $64 \times x - 50(x+1) = 76$

$\Rightarrow 64x - 50x - 50 = 76 \Rightarrow 14x = 76 + 50 = 126$

$\Rightarrow x = \frac{126}{14} = 9$

∴ Required average price = 9 + 1 = Rs. 10.

59. (2)



In ΔABC, $\angle BAC = 85°$, $\angle BCA = 75°$

$\therefore \angle ABC = 180° - 85° - 75° = 20°$

The angle subtended by an arc of a circle at the centre is double the angle subtended by it at any point on the remaining part of the circle.

$\therefore \angle AOC = \angle ABC = 40°$

$\therefore OA = OC = \text{radii}$

In ΔOAC, $\angle OAC = \angle OCA$ [The angles at the base of an isosceles traingle are equal]

$\angle OAC + \angle OCA = 180° - 40° = 140°$

$$\therefore \angle OAC = \frac{140°}{2} = 70°$$

60. (4) Volume of prism = Area of base × height

$$\Rightarrow 7200 = \frac{3\sqrt{3}}{2} p^2 \times 100\sqrt{3}$$

$$\Rightarrow 7200 = 50 \times 3 \times 3p^2 \Rightarrow p^2 = \frac{7200}{50 \times 3 \times 3} = 16$$

$$\therefore p = \sqrt{16} = 4$$

61. (4) $\dfrac{(2n-4)\times 90°}{n} = \dfrac{360°}{n} \times 2$

$\Rightarrow (2n - 4) \times 90° = 2 \times 360°$

$\Rightarrow 2n - 4 = 8$

$\Rightarrow 2n = 4 \Rightarrow n = 6$

62. (1) $x = \sqrt{6 + \sqrt{6 + \sqrt{6 + ...\infty}}}$

On squaring,

$$x^2 = 6 + \sqrt{6 + \sqrt{6 + ...\infty}}$$

$$\Rightarrow x^2 = 6 + x$$

$$\Rightarrow x^2 - x - 6 = 0$$

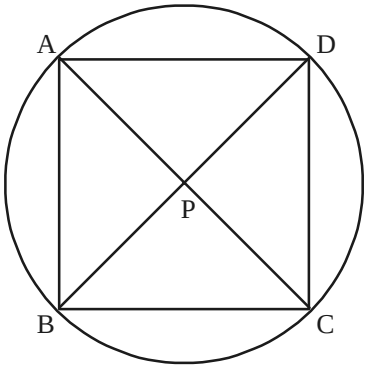
$$\Rightarrow x^2 - 3x + 2x - 6 = 0$$

$$\Rightarrow x(x-3) + 2(x-3) = 0$$

$$\Rightarrow (x-3)(x+2) = 0$$

$\Rightarrow x = 3$ because $x \neq -2$

63. (4)



$\angle APB = 110° = \angle CPD$

$\therefore \angle APD = 180° - 110° = 70° = \angle BPC$

$\therefore \angle PCB = 180° - 70° - 30° = 80°$

Angles subtended by same arcs at the circumference are equal.

$\therefore \angle ACB$ or $\angle PCB = \angle ADB = 80°$.

64. (3) Expression $= \sqrt{\dfrac{0.324 \times 0.081 \times 4.624}{1.5625 \times 0.0289 \times 72.9 \times 64}}$

$$= \sqrt{\frac{324 \times 81 \times 4624}{15625 \times 289 \times 729 \times 84}} = \frac{18 \times 9 \times 68}{125 \times 17 \times 27 \times 8} = 0.024$$

65. (4) According to the question, $\dfrac{n}{2} + \dfrac{n}{4} + \dfrac{n}{5} + 7 = n$

$$\Rightarrow \frac{10n + 5n + 4n}{20} + 7 = n$$

$$\Rightarrow \frac{19n}{20} + 7 = n \Rightarrow n - \frac{19n}{20} = 7 \Rightarrow \frac{n}{20} = 7$$

$\Rightarrow n = 20 \times 7 = 140.$

66. (1) Let time taken by A = x days

$\therefore$ Time taken by B = 2x days

Time taken by C = 3x days

According to the question,

$$\frac{1}{x} + \frac{1}{2x} + \frac{1}{3x} = \frac{1}{6}$$

$$\Rightarrow \frac{6+3+2}{6x} = \frac{1}{6} \Rightarrow \frac{11}{6x} = \frac{1}{6} \Rightarrow 6x = 6 \times 11$$

$$\Rightarrow x = \frac{6 \times 11}{6} = 11$$

$\therefore$ Time taken by C alone = 3x = 3 × 11 = 33 days

67. (1) $x + \dfrac{1}{x} = 1$

$$\Rightarrow x^2 + 1 = x \Rightarrow x^2 - x + 1 = 0$$

$$\therefore \frac{2}{x^2 - x + 2} = \frac{2}{x^2 - x + 1 + 1} = \frac{2}{0 + 1} = 2$$

68. (3) Let,

$$a = 1+\frac{1}{1+\frac{1}{10}} = 1+\frac{1}{\frac{100+1}{10}} = 1+\frac{10}{101} = \frac{101+10}{101} = \frac{111}{101}$$

Again,

$$b = 1-\frac{1}{1+\frac{1}{10}} = 1-\frac{1}{\frac{100+1}{10}} = 1-\frac{10}{101} = \frac{101-10}{101} = \frac{91}{101}$$

$\therefore$ Expression $= (a^2 - b^2) \div ab$

$= \{(a+b)(a-b)\} \div ab$

$$= \left(\frac{111}{101}+\frac{91}{101}\right)\left(\frac{111}{101}-\frac{91}{101}\right) \div \left(\frac{111}{101}\times\frac{91}{101}\right)$$

$$= \frac{202}{101}\times\frac{20}{101}\times\frac{101\times101}{111\times91} = \frac{4040}{10101}$$

69. (1) C.P. of cycle = Rs. x (let)

$$\therefore \text{S.P.} = \frac{110x}{100} = \text{Rs.}\frac{11x}{10}$$

Case II,

New C.P. = $\text{Rs.}\frac{9x}{10}$

$$\therefore \frac{11x}{10} + 60 = \frac{9x}{10}\times\frac{125}{100} = \text{Rs.}\frac{9x}{8}$$

$$\Rightarrow \frac{9x}{8} - \frac{11x}{8} = 60 \Rightarrow \frac{90x-88x}{8} = 60$$

$$\Rightarrow \frac{2x}{80} = 60 \Rightarrow \frac{x}{40} = 60 \Rightarrow x = 60\times40 = \text{Rs.}2400$$

70. (4) $2\sin^2\theta + 3\cos^2\theta = 2\sin^2\theta + 2\cos^2\theta + \cos^2\theta$

$= 2(\sin^2\theta + \cos^2\theta) + \cos^2\theta$

$= 2 + \cos^2\theta$

$\therefore$ Least value = 2 + 0 = 2 $\quad [\because \cos^2\theta \geq 0]$

71. (4) $\sin\theta + \cos\theta = \sqrt{2}\cos(90^\circ - \theta)$

$\Rightarrow \sin\theta + \cos\theta = \sqrt{2}\sin\theta$

On squaring,

$\cos^2\theta + \sin^2\theta + 2\cos\theta.\sin\theta = 2\sin^2\theta$

$\Rightarrow \cos^2\theta = \sin^2\theta - 2\cos\theta.\sin\theta$

On dividing by $\sin^2\theta$,

$\cot^2\theta = 1 - 2\cot\theta$

$\Rightarrow \cot^2\theta + 2\cot\theta - 1 = 0$

$$\therefore \cot\theta = \frac{-2\pm\sqrt{4+4}}{2} = \frac{-2+2\sqrt{2}}{2} = \sqrt{2}-1$$

or $-(\sqrt{2}+1)$

72. (2) $\sec^4\theta - \sec^2\theta$

$= \sec^2\theta(\sec^2\theta - 1)$

$= (1 + \tan^2\theta)(1 + \tan^2\theta - 1) = \tan^2\theta + \tan^4\theta$

73. (1) Expression

$= \cos 24^\circ + \cos 55^\circ + \cos 125^\circ + \cos 204^\circ + \cos 300^\circ$

$= \cos 24^\circ + \cos 55^\circ + \cos(180^\circ - 55^\circ)$
$\quad + \cos(180^\circ + 24^\circ) + \cos(360^\circ - 60^\circ)$

$= \cos 24^\circ + \cos 55^\circ - \cos 55^\circ - \cos 24^\circ + \cos 60^\circ$

$$= \cos 60^\circ = \frac{1}{2}$$

74. (2) $\tan A + \cot A = 2$

$$\Rightarrow \tan A + \frac{1}{\tan A} = 2 \Rightarrow \frac{\tan^2 A + 1}{\tan A} = 2$$

$\Rightarrow \tan^2 A + 1 = 2\tan A \Rightarrow \tan^2 A - 2\tan A + 1 = 0$

$\Rightarrow (\tan A - 1)^2 = 0 \Rightarrow \tan A - 1 = 0 \Rightarrow \tan A = 1$

$\Rightarrow \cot A = 1$

$\therefore \tan^{10} A + \cot^{10} A = 1 + 1 = 2$

75. (4) Radius of cylindrical vessel = r cm. (let)

Volume of conical piece of iron

$$= \frac{1}{3}\pi R^2 h = \left(\frac{1}{3}\pi\times14\times14\times30\right) \text{ cu. cm.}$$

Volume of raised wagter = $\pi r^2 \times 6.4$ cu. cm.

$$\therefore \pi r^2 \times 6.4 = \frac{1}{3}\pi\times14\times14\times30$$

$$\Rightarrow r^2 = \frac{14\times14\times10}{6.4} \Rightarrow r^2 = \frac{14^2\times10^2}{8^2} \Rightarrow r = \frac{14\times10}{8}$$

$$\Rightarrow 2r = \frac{2\times14\times10}{8} = 35 \text{ cm} = \text{diameter}$$