

SSC CHSL - CHT1 : 180229 GRAND TEST

HINTS AND SOLUTIONS

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

1. (1) $(6)^2 = 36; (6)^3 = 216$

Similarly, $(9)^2 = 81; (9)^3 = 729$

2. (2) M N C O P O R S
 1 2 3 4 1 2 3 4
 N C O M O R S P
 2 3 4 1 2 3 4 1

3. (3) Reasoning is the action or process of using one's ability to think, form opinions. Reasoning is a mental exercise. Cane (Verb) means to punish by beating with a cane performed physically.

4. (3)

5. (3) $F \xrightarrow{+2} h \xrightarrow{+2} j \xrightarrow{+2} L$
 $P \xrightarrow{+2} r \xrightarrow{+2} t \xrightarrow{+2} V$

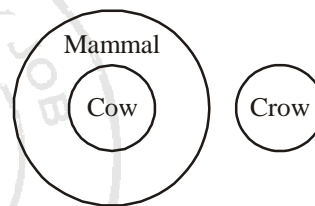
$K \xrightarrow{+3} n \xrightarrow{+2} p \xrightarrow{+2} R$

$C \xrightarrow{+2} e \xrightarrow{+2} g \xrightarrow{+2} I$

6. (3) Except Anil Kapoor, others are from the same family group.
 7. (4) 256 is the only number for which cube root is not possible.
 8. (1) Goa is a State of Union of India. All others are capital cities of States.
 Rajasthan — Jaipur
 Tamil Nadu — Chennai
 Mizoram — Aizawal
 9. (2) $198 + (2)^2 = 202$
 $202 + (3)^2 = 211$
 $211 + (4)^2 = 227$
 $227 + (5)^2 = 252$

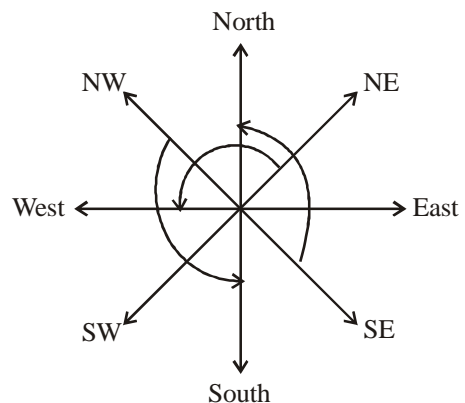
10. (1) $12 \xrightarrow{\times 2} 24 \xrightarrow{\times 3} 72 \xrightarrow{\times 4} 288 \xrightarrow{\times 5} 1440$

11. (3) Crows come under the class Aves. Cow is a mammal.



12. (1) Suppose the present age of Arun is $4x$ years and that of Deepak is $3x$ years.
 6 years hence, Arun's age = $4x + 6 = 26$
 $\Rightarrow 4x = 26 - 6$
 $x = \frac{20}{4} = 5$
 \therefore Present age of Deepak = $3x = 15$ years
 13. (2) 5, 2, 3, 1, 4
 14. (4) Any written piece is recognized as song when it is sung by a singer. Therefore, only Conclusion I follows.
 15. (4) There is no 'U' letter in the given word.

16. (4)



17. (2) After changing the signs, we have

$$\frac{52 - 8 \times 6 \div 2}{16 + 12 \div 6 \times 3 - 18} = \frac{52 - 8 \times 3}{16 + 6 - 18} = \frac{52 - 24}{4} = \frac{28}{4} = 7$$

18. (4) $235 \Rightarrow (2)^2 + (3)^2 + (5)^2 = 38$

$452 \Rightarrow (4)^2 + (5)^2 + (2)^2 = 45$

$345 \Rightarrow (3)^2 + (4)^2 + (5)^2 = \boxed{50}$

19. (2) $83 \Rightarrow 8^3 = 512 \Rightarrow \frac{512}{2} = 256$

$42 \Rightarrow 4^2 = 16 \Rightarrow \frac{16}{2} = 8$

$63 \Rightarrow 6^3 = 216 \Rightarrow \frac{216}{2} = 108.$

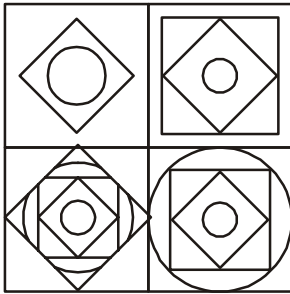
20. (2) First Column $5 - 4 = 1$ and $(1)^3 = 1$

Second Column $7 - 3 = 4$ and $(4)^3 = 64$

Third Column $8 - 2 = 6$ and $(6)^3 = \boxed{216}$

21. (3) a \boxed{b} ca/ \boxed{a} bca/a \boxed{b} b \boxed{c} /a \boxed{a} bb/c \boxed{c}

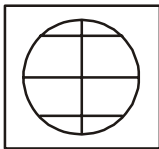
22. (1)



23. (1)



24. (4)



25. (2) 89, 33, 57, 43
F A R E

51. (4) Volume of the sphere = $\frac{4}{3} \pi r^3 = \frac{4}{3} \pi$ cu.cm

Volume of wire = $\pi r^2 h = 100 \pi r^2$ cu. Cm

$\therefore 100 \pi r^2 = \frac{4}{3} \pi$

$$\Rightarrow r^2 = \frac{4}{300} = \frac{1}{75}$$

$$\therefore r = \sqrt{\frac{1}{75}} = 0.11 \text{ cm}$$

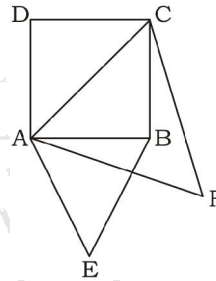
52. (2) $\sqrt{\frac{\sqrt{36} - \sqrt{24} + \sqrt{24} - \sqrt{16}}{5 + \sqrt{9}}} = \sqrt{\frac{6 - 4}{5 + \sqrt{9}}} = \sqrt{\frac{2}{8}} = \frac{1}{2}$

53. (2) S.P. of 250 chairs – C.P. of 250 chairs
= S.P. of 50 chairs
 \Rightarrow S.P. of 200 chairs = C.P. of 250 chairs

$$\therefore \text{Percentage profit} = \frac{250 - 200}{200} \times 100 = 25\%$$

54. (3) $\sqrt{19.36} + \sqrt{0.1936} + \sqrt{0.001936} + \sqrt{0.00001936}$
 $= 4.4 + 0.44 + 0.044 + 0.0044 = 4.8884$

55. (1)



Here $AC^2 = 2AB^2$

As ΔABE and ΔABC are equiangular.

$\Rightarrow \Delta ABE \sim \Delta ABC$

\therefore Required ratio

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

$$\therefore \text{Square of the ratio} = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$$

56. (2) Let the price be 100

$$100 \xrightarrow{+40\%} 140 \xrightarrow{-10\%} 126 \xrightarrow{-10\%} 113.40$$

So, increase in price = 13.4%

57. (1) 60% of $(x - y) = 40\%$ of $(x + y)$

$$\Rightarrow \frac{50}{100} (x - y) = \frac{30}{100} (x + y)$$

$$\Rightarrow 5(x - y) = 3(x + y)$$

$$\Rightarrow 2x = 10y \Rightarrow x = 5y$$

\therefore Required percentage

$$= \left(\frac{y}{x} \times 100\right)\% = \left(\frac{y}{5y} \times 100\right)\% = 20\%$$

58. (1) Ram' expenditure = Rs. 3 x
Savings = Rs. 2x

$$\text{New income} = \frac{5x \times 110}{100} = \text{Rs. } \frac{11x}{2}$$

$$\text{Expenditure} = \frac{3x \times 112}{100} = \text{Rs. } \frac{336x}{100}$$

$$\text{Savings} = \frac{11x}{2} - \frac{336x}{100} = \frac{550x - 336x}{100} = \text{Rs. } 214x$$

$$\text{Increase in savings} = \frac{214x}{100} - 2x = \frac{14x}{100}$$

$$\therefore \text{Percentage increase} = \frac{14x}{200x} \times 100 = 7\%$$

59. (4) If the principal be Rs. P, then S.I = $\frac{P}{9}$

$$\text{If rate} = r\% \text{ then Rate} = \frac{\text{S.I} \times 100}{\text{Principal} \times \text{Time}}$$

$$\Rightarrow r = \frac{1 \times 100}{9 \times r} = 9r^2 = 100 \Rightarrow r^2 = \frac{100}{9}$$

$$R = \frac{100}{9} = 3\frac{1}{3}\%$$

60. (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 $8x$).

$$\text{i.e. } \left(\frac{125}{100} \times 7x\right) \text{ and } \left(\frac{115}{100} \times 8x\right) \text{ i.e. } \frac{875x}{5} \text{ and } \frac{920x}{5}$$

$$\therefore \text{Required ratio} = 875 : 920 = \mathbf{175 : 184}$$

61. (3) Given $x = \frac{\sqrt{3}}{2}$

$$\text{then, } \frac{\sqrt{1+x}}{1+\sqrt{1+x}} \times \frac{1-\sqrt{1+x}}{1-\sqrt{1+x}} + \frac{\sqrt{1-x}}{1-\sqrt{1-x}} \times \frac{1+\sqrt{1-x}}{1+\sqrt{1-x}}$$

$$= \frac{\sqrt{1+x}-1-x}{1-1-x} + \frac{\sqrt{1-x}+1-x}{1-1+x}$$

$$= \frac{\sqrt{1-x}+1-x}{x} - \frac{\sqrt{1+x}-1-x}{x}$$

$$= \frac{\sqrt{1-x}+1-x-\sqrt{1+x}+1+x}{x}$$

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

$$= \frac{2+\frac{\sqrt{4-2\sqrt{3}}}{2}-\frac{\sqrt{4+2\sqrt{3}}}{2}}{\frac{\sqrt{3}}{2}}$$

$$= \frac{4+\sqrt{3}-1-\sqrt{3}-1}{\sqrt{3}} = \frac{2}{\sqrt{3}}$$

$$\therefore \left(\frac{\sqrt{1+x}}{1+\sqrt{1+x}} + \frac{\sqrt{1-x}}{1-\sqrt{1-x}}\right)^2 = \left(\frac{2}{\sqrt{3}}\right)^2 = \frac{4}{3}$$

62. (3) C.P. of the article = Rs. 100 and market price = Rs. x

$$\therefore x \times \frac{90}{100} = 117 \Rightarrow x = \frac{117 \times 100}{90} = 130 = 30\% \text{ above C.P.}$$

63. (3) $(x+y)^2 = 4xy$
 $\Rightarrow x^2 + y^2 + 2xy - 4xy = 0$
 $\Rightarrow (x-y)^2 = 0 \Rightarrow x = y$

64. (3) $x^2 + y^2 + z^2 = xy + yz + zx$
 $\Rightarrow 2x^2 + 2y^2 + 2z^2 - 2xy - 2yz - 2zx = 0$

$$\Rightarrow (x-y)^2 + (y-z)^2 + (z-x)^2 = 0$$

$$\Rightarrow x - y = 0 \Rightarrow x = y$$

$$y - z = 0 \Rightarrow y = z$$

$$z - x = 0 \Rightarrow z = x$$

$$\therefore \frac{4x+2y-3z}{2x} = \frac{4+2-3}{2} = \frac{3}{2}$$

65. (2) Total C. P = $\frac{240 \times 48}{12} = \text{Rs. } 960$

$$\text{S.P. for a gain of } 25\% = \frac{960 \times 125}{100} = \text{Rs. } 1200$$

$$\text{Amount received on half of bananas at Rs. } 5 \text{ per banana} = 120 \times 5 = \text{Rs. } 600$$

$$\text{Remaining bananas} = 120 \times \frac{5}{6} = 100$$

$$\text{S.P. of these } 100 \text{ bananas} = \text{Rs. } 600$$

$$\therefore \text{Rate} = \text{Rs. } 6 \text{ per banana.}$$

66. (2) Let the base of triangle be decreased by $x\%$.

ATQ,

$$20 - x - \frac{20x}{100} = 0 \Rightarrow x + \frac{x}{5} = 20 \Rightarrow \frac{6x}{5} = 20$$

$$\Rightarrow x = \frac{50}{3} = 16\frac{2}{3}\%$$

$$\therefore \text{Required percentage} = 16\frac{2}{3}\%$$

$$67. (3) \left[18000 \times \left(1 + \frac{R}{100} \right)^2 - 18000 \right] - \left(\frac{18000 \times R \times 2}{100} \right) = 135$$

$$\Rightarrow 18000 \left[\left(1 + \frac{R}{100} \right)^2 - 1 - \frac{2R}{100} \right] = 135$$

$$\Rightarrow 18000 \left[\frac{(100 + R)^2 - 10000 - 200R}{10000} \right] = 135$$

$$\Rightarrow R^2 = \frac{135 \times 5}{9} = 75 \Rightarrow R = 8.66\%$$

$$68. (4) x = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}} = \frac{(\sqrt{3} - \sqrt{2})(\sqrt{3} - \sqrt{2})}{(\sqrt{3} + \sqrt{2})(\sqrt{3} + \sqrt{2})}$$

$$= \frac{(\sqrt{3} - \sqrt{2})^2}{3 - 2} = 3 + 2 - 2\sqrt{3} \cdot \sqrt{2} = 5 - 2\sqrt{6}$$

$$\therefore y = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}} = 5 + 2\sqrt{6}$$

$$\therefore x + y = 5 - 2\sqrt{6} + 5 + 2\sqrt{6} = 10$$

$$xy = (5 - 2\sqrt{6})(5 + 2\sqrt{6}) = 25 - 24 = 1$$

$$\therefore x^3 + y^3 = (x + y)^3 - 3xy(x + y) = (10)^3 - 3(10) = 1000 - 30 = 970.$$

$$69. (1) x = r \cos \theta \cdot \cos \phi$$

$$y = r \cos \theta \cdot \sin \phi$$

$$z = r \sin \theta$$

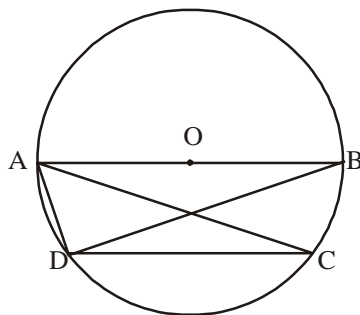
$$\therefore x^2 + y^2 + z^2 = r^2 \cos^2 \theta \cdot \cos^2 \phi + r^2 \cos^2 \theta \cdot \sin^2 \phi + r^2 \sin^2 \theta$$

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

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

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

70. (2)



$\therefore \angle BAC = \angle BDC = 20^\circ$ (on same arc BC)

$\angle ADB = 90^\circ$ (Angle of semi-circle)

$$71. (1) \frac{\text{Area of } \triangle BDF}{\text{Area of hexagon}} = \frac{1}{2}$$

\therefore Area of hexagon = 6 \times area of equilateral triangle

$$= 6 \times \frac{\sqrt{3}}{4} \times 2^2 = 6\sqrt{3} \text{ cm}^2$$

$$\therefore \text{Area of } \triangle BDF = 3\sqrt{3} \text{ cm}^2 = 5.2 \text{ cm}^2.$$

$$72. (3) \text{ Per cent increase} = \frac{380 - 320}{320} \times 100 = 18.75$$

73. (2) Total production :

Wheat \Rightarrow 3700 million tonnesRice \Rightarrow 2000 million tonnesBarley \Rightarrow 1800 million tonnesOther cereals \Rightarrow 2400 million tonnes

$$\therefore x = \frac{3700}{9900} \times 100 = 37.4$$

$$74. (1) \text{ Percentage increase : Rice} = \frac{160}{400} \times 100 = 40$$

$$\text{Cereals} = \frac{190}{500} \times 100 = 38$$

$$75. (4) \text{ Required difference} = \frac{2000}{5} - \frac{1800}{5} = 400 - 360 = 40$$

million tonnes.