

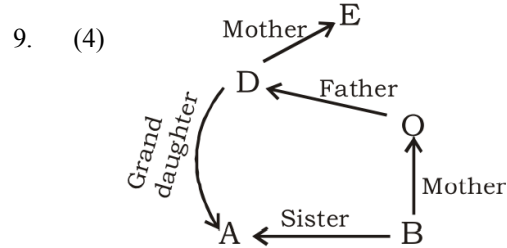
SSC CGL - 180620 GRAND TEST
HINTS AND SOLUTIONS

ANSWER KEY

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

- (1) $78 \Rightarrow 7 \times 8 = 56 \Rightarrow \frac{56}{2} = 28$
 $84 \Rightarrow 8 \times 4 = 32 \Rightarrow \frac{32}{2} = 16$
- (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
- (2) Physics is related to science and History is related to Social science.
- (2) $34 \Rightarrow 3^4 = 81$
 $25 \Rightarrow 2^5 = 32$
- (4) $328 \Rightarrow 8^2 \times 3 = 64 \times 3 = 192 \Rightarrow 328 - 192$
 $215 \Rightarrow 5^1 \times 2 = 10 \Rightarrow 215 - 10$
 $342 \Rightarrow 2^4 \times 3 = 16 \times 3 = 48 \Rightarrow 342 - 48$
 $235 \Rightarrow 5^3 \times 2 = 125 \times 2 = 250 \neq 258 \Rightarrow 235 - 258$

- (3) Except Anil Kapoor, others are from the same family group.
- (1) Except PQRS, in others atleast one vowel is present.
- (4) 256 is the only number for which cube root is not possible.



- (4) Neither conclusion (1) nor (2) follows
- (4) $12 \times 18 = 24 \times 9$, $16 \times 24 = 8 \times 48$,
 $15 \times 8 = 24 \times 5$
- (2) $83 \Rightarrow 8^3 = 512 \Rightarrow \frac{512}{2} = 256$
 $42 \Rightarrow 4^2 = 16 \Rightarrow \frac{16}{2} = 8$
 $63 \Rightarrow 6^3 = 216 \Rightarrow \frac{216}{2} = 108$
- (2) $12 \times 6 + 18 \times 4 = 144 \Rightarrow \sqrt{144} = 12$
 $18 \times 8 + 36 \times 5 = 144 + 180 = 324 \Rightarrow \sqrt{324} = 18$
 $5 \times 8 + 10 \times 6 = 40 + 60 = 100 \Rightarrow \sqrt{100} = 10$
- (4)
- (4) As, we can see 2 R's in the word RIVER, which is not present in the given word ENVIRONMENT.
- (3) $2 \times 1 + 3 = 5$
 $5 \times 2 + 6 = 16$
 $16 \times 3 + 9 = 57$
 $57 \times 4 + 12 = 240$
- (4) $8 + \frac{8}{2} = 12$, $12 + \frac{12}{2} = 18$, $18 + \frac{18}{2} = 27$,
 $27 + \frac{27}{2} = 40.5$.

- (1) $12 \xrightarrow{\times 2} 24 \xrightarrow{\times 3} 72 \xrightarrow{\times 4} 288 \xrightarrow{\times 5} 1440$
- (2) 5, 2, 3, 1, 4
- (4) PQRS/PSQR/PRSQ/PQR
- (2) After changing the signs, we have
 $\frac{52 - 8 \times 6 \div 2}{16 + 12 \div 6 \times 3 - 18} = \frac{52 - 8 \times 3}{16 + 6 - 18} = \frac{52 - 24}{4} = \frac{28}{4} = 7$
- (2)
- (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, $F + B + G = 42 + 6 + 56 = 104$

24. (3)

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

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

52. (3) Let the highest score be x.
Then, lowest score = (x - 150)
Then, $(50 \times 40) - [x + (x - 150)] = 38 \times 48$
 $\Rightarrow 2x = 2000 + 150 - 1824$
 $\Rightarrow 2x = 326 \Rightarrow x = 163$
 \therefore Lowest score = $163 - 150 = 13$

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

54. (1) $5 \tan \theta = 4 \Rightarrow \tan \theta = \frac{4}{5}$

Now,

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

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

\therefore Required ratio = $875 : 920 = 175 : 184$.

56. (3) Let cost price = ₹ 100

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

\Rightarrow Marked Price = ₹ 240
 \therefore Required ratio = $240 : 100 = 12 : 5$.

57. (1) Let the speed of the stream be x m/h.

Then,

Speed downstream = (8 + x) m/h,

Speed upstream = (8 - x) m/h

$\therefore \frac{60}{(8-x)} - \frac{60}{(8+x)} = 4$

Put x = 2, then it will satisfy the equation

$\Rightarrow \frac{60}{8-2} - \frac{60}{8+2} = \frac{60}{6} - \frac{60}{10} \Rightarrow 10 - 6 = 4 \Rightarrow 4 = 4$

\therefore Speed of Stream = 2 miles/hr

58. (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 = $7 + 7 = 14$

59. (2) Let the price be 100

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

So, increase in price = 13.4%

60. (2) Let speed of the car be x km/h

Then, speed of the train = $\frac{150}{100}x = \left(\frac{3}{2}x\right)$ km/h

$\therefore \frac{60}{x} - \frac{60}{\frac{3}{2}x} = \frac{125}{10 \times 60}$

$\Rightarrow \frac{60}{x} - \frac{40}{x} = \frac{5}{24} \Rightarrow x = \left(\frac{20 \times 24}{5}\right) = 96$ km/h

\therefore Speed of the car = 96 km/h

61. (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 Required percentage = $16\frac{2}{3}\%$.

62. (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 = $6 \times 10^2 = 600$ cm²

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

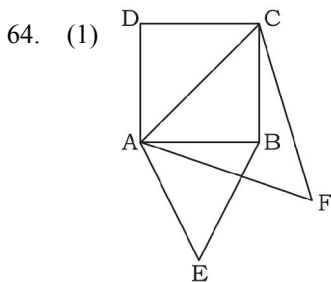
$$\begin{aligned} \text{then, } & \frac{\sqrt{1+x}}{1+\sqrt{1+x}} \times \frac{1-\sqrt{1+x}}{1-\sqrt{1+x}} + \frac{\sqrt{1-x}}{1-\sqrt{1-x}} \times \frac{1+\sqrt{1-x}}{1+\sqrt{1-x}} \\ &= \frac{\sqrt{1+x}-1-x}{1-1-x} + \frac{\sqrt{1-x}+1-x}{1-1+x} \\ &= \frac{\sqrt{1-x}+1-x}{x} - \frac{\sqrt{1+x}-1-x}{x} \\ &= \frac{\sqrt{1-x}+1-x-\sqrt{1+x}+1+x}{x} \end{aligned}$$

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

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

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

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



Here $AC^2 = 2AB^2$

As $\triangle ABE$ and $\triangle ABC$ are equiangular.

$\Rightarrow \triangle ABE \sim \triangle ABC$

\therefore Required ratio

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

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

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

66. (3) Let the ratio be $x : (x + 60)$

Then, $\frac{x}{(x+60)} = \frac{2}{7}$

$\Rightarrow 7x = 2x + 120 \Rightarrow x = 24$

\therefore Required ratio $= 24 : 84 = 2 : 7$

67. (2) Remaining distance $= 3$ km

and Remaining time $= \left(\frac{1}{5} \times 50 \right) \text{ min} = 10 \text{ min} = \frac{1}{6} \text{ hr.}$

\therefore Required speed $= (3 \times 6) \text{ km/hr} = 18 \text{ km/hr}$

68. (1) $\frac{\sin 2\theta + \sin \theta}{\cos 2\theta + \cos \theta + 1} = \frac{2 \sin \theta \cdot \cos \theta + \sin \theta}{2 \cos^2 \theta - 1 + \cos \theta + 1}$

$$= \frac{\sin \theta (2 \cos \theta + 1)}{2 \cos^2 \theta + \cos \theta} = \frac{\sin \theta (2 \cos \theta + 1)}{\cos \theta (2 \cos \theta + 1)}$$

$$= \frac{\sin \theta}{\cos \theta} = \tan \theta = \sqrt{\tan^2 \theta} = \sqrt{\sec^2 \theta - 1}$$

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

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

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

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

70. (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

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

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

72. (3) Total profit required $= ₹ (42 \times 18) = ₹ 756$

Profit on 22 sarees $= ₹ (460 + 144) = ₹ 604$

Profit on 20 sarees $= ₹ (756 - 604) = ₹ 152$

Average profit on these sarees $= ₹ \left(\frac{152}{24} \right) = ₹ 6.33$.



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%

76. (1) Since the sentence is in simple present tense hence the first part of the sentence should read as 'Excellence is not luck'.
77. (4) Given sentence is in active voice and 'subject' (He) is also at right place. Hence No error.
78. (3) 'So' does not mean 'very' Hence replace 'so' with 'very'.
79. (2) Here 'funds' is a plural noun hence it will agree with plural verb (are). So replace 'is' with 'are'.
89. (1) Since 'assemble' is an 'intransitive verb', it will remain in active form.
90. (1) Here we are comparing 'movements' of a young man with the movements of an old man hence 'those of' will come.
91. (2) 'Carry on' means 'to continue an activity or task'.
92. (3) 'For' is used for 'Period of time'. Hence correct usage is 'for the past two weeks'.
93. (1) In the principle clause, there is a need of subject. Thus replace (adjective) 'persistent' with noun 'persistence'.

