SSC CGL - 180621 GRAND TEST
HINTS AND SOLUTIONS
ANSWER KEY

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

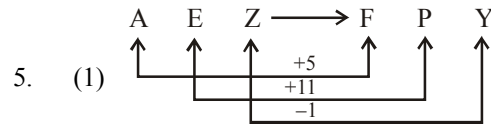1. (1) $(1)^2 = 1$; $(3)^2 = 9 \Rightarrow 19$
   Similarly, $(2)^2 = 4$; $(1)^2 = 1 \Rightarrow 41$

2. (1)

   A   P   P   L   E
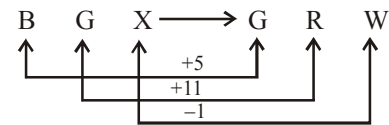   ↓   ↓   ↓   ↓   ↓
   1 + 16 + 16 + 12 + 5 = 50
   Similarly,
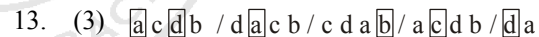
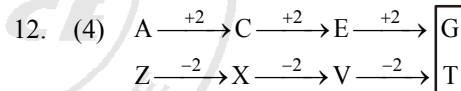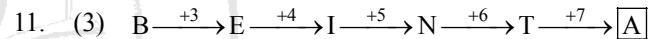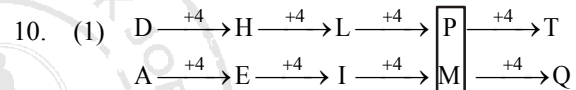   O   R   A   N   G   E
   ↓   ↓   ↓   ↓   ↓   ↓
   15 + 18 + 1 + 14 + 7 + 5 = 60

3. (2) Fire causes smoke. Smoke comes out when something is burnt in fire. Similarly, cloud causes rain.

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

5. (1)

   Similarly,

6. (4) Major, Colonel and Brigadier are different ranks in the Indian Army. Admiral is the topmost rank in the Indian Navy.

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

8. (2) Except remedy, all other terms denote loss of something.

9. (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

10. (1) $D \xrightarrow{+4} H \xrightarrow{+4} L \xrightarrow{+4} \boxed{P} \xrightarrow{+4} T$
    $A \xrightarrow{+4} E \xrightarrow{+4} I \xrightarrow{+4} \boxed{M} \xrightarrow{+4} Q$

11. (3) $B \xrightarrow{+3} E \xrightarrow{+4} I \xrightarrow{+5} N \xrightarrow{+6} T \xrightarrow{+7} \boxed{A}$

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

13. (3) a c ⟦d⟧ b / d ⟦a⟧ c b / c d a ⟦b⟧ / a ⟦c⟧ d b / ⟦d⟧ a

14. (4) 21 + 7 = 28
    28 + 5 = 33
    33 + 3 = $\boxed{36}$
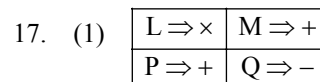   36 + 1 = 37
    37 – 1 = 36
    Therefore, the number 35 is wrong in the series.

15. (2) 0 + 7 = 7
    7 + 21 = 28
    28 + 35 = 63
    63 + 61 = 124
    124 + 87 = $\boxed{211}$
    Therefore, the number 215 is wrong in the series.

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

17. (1)

L ⇒ ×	M ⇒ +
P ⇒ +	Q ⇒ –

    16 P 24 M 8 Q 6 M 2 L 3 = ?
    $\Rightarrow ? = 16 + 24 + 8 - 6 \div 2 \times 3$
    $\Rightarrow ? = 16 + 3 - 3 \times 3$
    $\Rightarrow ? = 16 + 3 - 9 = \boxed{10}$

18. (1)

F	L	A	T	T	E	R
↓	↓	↓	↓	↓	↓	↓
7	2	3	8	8	5	9

M	O	T	H	E	R
↓	↓	↓	↓	↓	↓
4	6	8	1	5	9

Therefore,

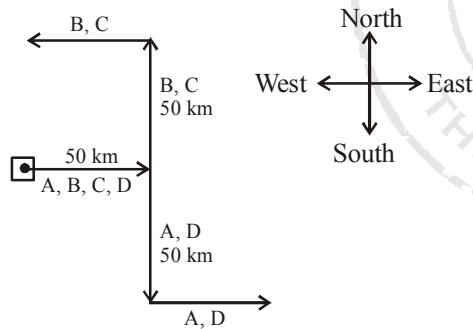| M	A	M	M	O	T	H
↓	↓	↓	↓	↓	↓	↓
4	3	4	4	6	8	1

19. (1) $16 \Rightarrow (2 + 2)^2 = (4)^2$
$9 \Rightarrow (3 + 0)^2 = (3)^2$
$81 \Rightarrow (1 + 8)^2 = (9)^2$
Similarly, $64 \Rightarrow (4 + 4)^2 = (8)^2$

20. (4) The product of two numbers in a sector is equal to the central number in the previous sector.
$3 \times 5 = 15$
$8 \times 3 = 24$
$7 \times 2 = 14$
$5 \times 3 = \boxed{15}$
$8 \times 4 = 32$
$9 \times 1 = 9$
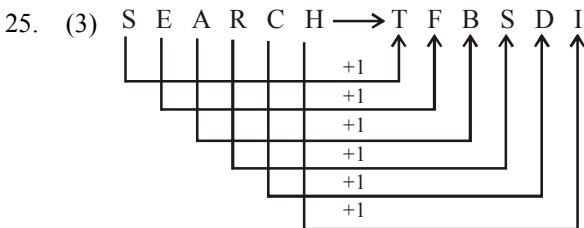$9 \times 2 = 18$
$7 \times 4 = 28$

21. (3)

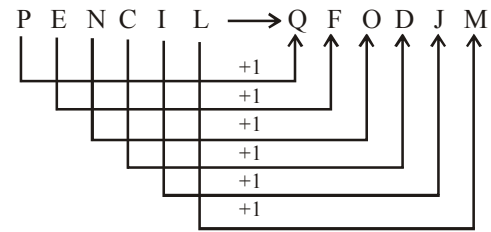A $\Rightarrow$ East, B $\Rightarrow$ West, C $\Rightarrow$ West, D $\Rightarrow$ East.

22. (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.

23. (3) QMPN $\boxed{PQR}$ ROPQNOP $\boxed{PQR}$ MQRO $\boxed{PQR}$ PPRR $\boxed{PQR}$ P

24. (2)

25. (3)

Similarly,

51. (3) Average units consumption in 2012
$$= \frac{600 + 700 + 400 + 300 + 200}{5} = \frac{2200}{5} = 440 \text{ units}$$
Required months $\Rightarrow$ July, August.

52. (4) Average units consumption in year 2013
$$= \frac{550 + 500 + 400 + 350 + 500}{5} = \frac{2300}{5} = 460 \text{ units.}$$

53. (4) In the month of November,
Difference = 500 – 200 = 300 units
In the month of August,
Difference = 700 – 500 = 200 units

54. (4) Total consumption in 2012 = 2200 units
Total consumption in 2013 = 2300 units
Percentage increase
$$= \left(\frac{2300 - 2200}{2200} \right) \times 100 = \frac{100}{22} = \frac{50}{11} = 4.5\%$$

55. (4) Let A, B, C, D and E in kg. represent their respective weights. Then,
A + B + C = 84 × 3 = 252 kg.
A + B + C + D = 80 × 4 = 320 kg.
∴ D = (320 – 252) kg = 68 kg
E = 68 + 3 = 71 kg.
B + C + D + E = 79 × 4 = 316 kg.
Now,
(A + B + C + D) – (B + C + D + E) = 320 – 316
$\Rightarrow$ A – E = 4 kg.
$\Rightarrow$ A = 4 + E = 4 + 71 = 75 kg.

56. (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,
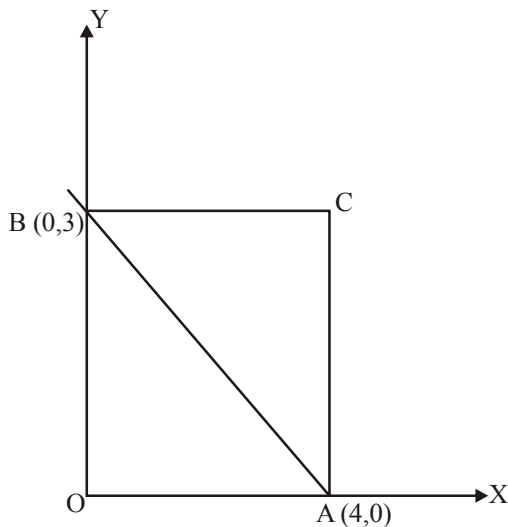$$3 \times 0 + 4y = 12 \Rightarrow y = \frac{12}{4} = 3$$
∴ Co-ordinates of the point of intersection on y-axis = (0, 3)
Again putting y = 0 in the equaiton 3x + 4y = 12,
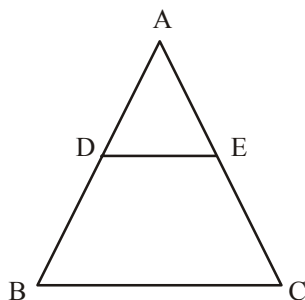$$3x + 4 \times 0 = 12 \Rightarrow x = \frac{12}{3} = 4$$
∴ Co-ordinates of the point of intersection on x-axis = (4, 0).

AC = 3 units, BC = 4 units

∴ Area of ∆ABC

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

57. (4)

∠BAC = 40°, ∠ABC = 65°

∴ ∠ACB = 180° − 40° = 75°

DE ∥ BC

∴ ∠AED = ∠ACB = 75°

∴ ∠CED = 180° − 75° = 105°

58. (1) $x^2 + y^2 + z^2 = 2 (x + z - 1)$

$\Rightarrow x^2 + y^2 + z^2 = 2x + 2z - 2$

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

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

$\Rightarrow (x - 1)^2 + y^2 + (z - 1)^2 = 0$

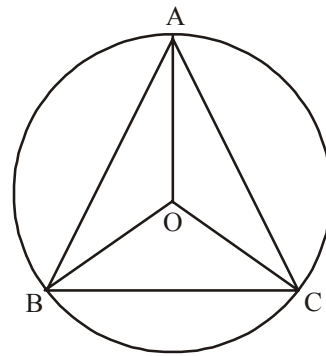$[\because a^2 + b^2 + c^2 = 0 \Rightarrow a = 0, b = 0, c = 0]$

∴ $x - 1 = 0 \Rightarrow x = 1$

$y = 0$

$z - 1 = 0 \Rightarrow z = 1$

∴ $x^3 + y^3 + z^3 = 1 + 0 + 1 = 2$

59. (2)

In ∆ABC, ∠BAC = 85°, ∠BCA = 75°

∴ ∠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.

∴ ∠AOC = ∠ABC = 40°

∴ OA = OC = radii

In ∆OAC, ∠OAC = ∠OCA [The angles at the base of an isosceles traingle are equal]

∠OAC + ∠OCA = 180° − 40° = 140°

∴ ∠OAC = $\dfrac{140°}{2} = 70°$

60. (2) $\dfrac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta} = 2\dfrac{51}{79} = \dfrac{158 + 51}{79} = \dfrac{209}{79}$

By componendo and divdendo,

$\dfrac{\sec\theta + \tan\theta + \sec\theta - \tan\theta}{\sec\theta + \tan\theta - \sec\theta + \tan\theta} = \dfrac{209 + 79}{209 - 79}$

$\Rightarrow \dfrac{2\sec\theta}{2\tan\theta} = \dfrac{288}{130} \Rightarrow \dfrac{\sec\theta}{\tan\theta} = \dfrac{144}{65}$

∴ $\sin\theta = \dfrac{\tan\theta}{\sec\theta} = \dfrac{65}{144}$

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

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

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

∴ $p = \sqrt{16} = 4$

62. (3) Single equivalent discount

$= \left(10 + 20 - \dfrac{10 \times 20}{100}\right)\% = (30 - 2)\% = 28\%$

∴ C.P. of article = 100 − 28 = ₹ 72

Actual cost price of article = $\dfrac{72 \times 110}{100} = ₹ 79.2.$

∴ For a profit of 15%, required S.P.

$= \dfrac{79.2 \times 115}{100} = ₹ 91.08.$

63. (2) $x = z = 225$, $y = 226$

$\therefore x + y + z = 225 + 226 + 225 = 676$

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

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

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

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

64. (3) Required mass of lead

$= 8000 \times \dfrac{60}{100} \times \left(1 - \dfrac{3}{400}\right)$

$= 8000 \times \dfrac{60}{100} \times \dfrac{397}{400} = 4764$ kg.

65. (3) $4a - \dfrac{4}{a} = -3$

On dividing by 4,

$\Rightarrow a - \dfrac{1}{a} = \dfrac{-3}{4}$

$\therefore a^3 - \dfrac{1}{a^3} = \left(a - \dfrac{1}{a}\right)^3 + 3a \times \dfrac{1}{a}\left(a - \dfrac{1}{a}\right)$

$= \left(\dfrac{-3}{4}\right)^3 + 3 \times \dfrac{-3}{4} = -\dfrac{27}{64} - \dfrac{9}{4} = \dfrac{-27 - 144}{64} = \dfrac{-171}{64}$

$\therefore a^3 - \dfrac{1}{a^3} + 3 = \dfrac{-171}{64} + 3 = \dfrac{-171 + 192}{64} = \dfrac{21}{64}$

66. (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 $a + b - c = 0$

$\therefore$ Expression $= 0$

67. (3) Let the C.P. of article be Rs.100 and the marked price be ₹ x.

Case I

$\dfrac{x \times 90}{100} = 120 \Rightarrow x = \dfrac{120 \times 100}{90} = ₹ \dfrac{400}{3}$

Case II

S.P. $= \dfrac{x \times 80}{100} = ₹ \dfrac{4x}{5} = ₹ \left(\dfrac{4}{5} \times \dfrac{400}{3}\right) = ₹ \dfrac{320}{3}$

$\therefore$ Profit $= ₹ \left(\dfrac{320}{3} - 100\right) = ₹ \left(\dfrac{320 - 300}{3}\right) = ₹ \dfrac{20}{3}$

$\therefore$ Profit percent $= \dfrac{20}{3}\% = 6\dfrac{2}{3}\%$

68. (1)
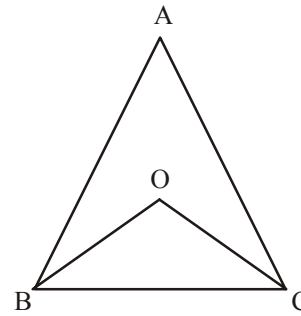
$\angle OBC = \dfrac{1}{2}\angle ABC$, $\angle OCB = \dfrac{1}{2}\angle ACB$

From ΔOBC, $\angle OBC + \angle OCB + \angle BOC = 180°$

$\dfrac{1}{2}(\angle ABC + \angle ACB) + \angle BOC = 180°$

$\Rightarrow \dfrac{1}{2}(180° - \angle BAC) + \angle BOC = 180°$

$\Rightarrow \dfrac{1}{2}(180° - 100°) + \angle BOC = 180°$

$\Rightarrow \angle BOC = 180° - 40° = 140°$

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

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

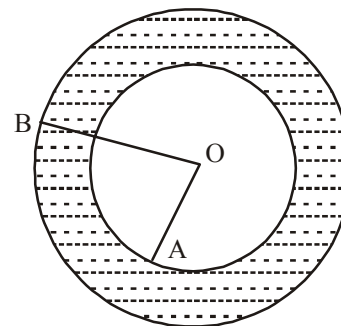Time taken by C = 3x days

According to the question,

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

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

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

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

70. (4)

Let the radius of swimming pool be r metre.

Breadth of shaded part = 4 metre

$\therefore$ OB = (r + 4) metre

According to the question,

$$\pi \times OB^2 - \pi \times OA^2 = \frac{11}{25}\pi \times OA^2$$

$$\Rightarrow (r+4)^2 - r^2 = \frac{11}{25}r^2$$

$$\Rightarrow r^2 + 8r + 16 - r^2 = \frac{11}{25}r^2 \Rightarrow 8r + 16 = \frac{11}{25}r^2$$

$$\Rightarrow 200r + 400 = 11r^2 \Rightarrow 11r^2 - 200r - 400 = 0$$

$$\Rightarrow 11r^2 - 220r + 20r - 400 = 0$$

$$\Rightarrow 11r(r-20) + 20(r-20) = 0$$

$$\Rightarrow (r-20)(11r+20) = 0$$

$$\Rightarrow r = 20 \text{ metre because } r \neq -\frac{20}{11} \text{ metre.}$$

71. (2) Let C complete the work in x days.

$$\therefore \text{ B's 1 day's work} = \frac{1}{20} - \frac{1}{x}$$

and, A's 1 day's work $= \dfrac{2-3}{60} + \dfrac{1}{x} = \dfrac{1}{x} - \dfrac{1}{60}$

According to the question,

$$5\left(\frac{1}{x} - \frac{1}{60}\right) + 15\left(\frac{1}{20} - \frac{1}{x}\right) + \frac{18}{x} = 1$$

$$\Rightarrow \frac{5}{x} - \frac{1}{12} + \frac{15}{20} - \frac{15}{x} + \frac{18}{x} = 1$$

$$\Rightarrow \frac{5}{x} - \frac{15}{x} + \frac{18}{x} = 1 + \frac{1}{12} - \frac{3}{4}$$

$$\Rightarrow \left(\frac{5-15+18}{x}\right) = \frac{12+1-9}{12} \Rightarrow \frac{8}{x} = \frac{1}{3}$$

$$\Rightarrow x = 8 \times 3 = 24 \text{ days.}$$

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

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

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

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

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

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

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

$$\Rightarrow \cot A = 1$$

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

74. (3) Here distance is constant.

$$\therefore \text{Speed} \propto \frac{1}{\text{Time}}$$

$$\therefore \text{ Ratio of the speeds of A and B} = \frac{\frac{7}{2}}{4} = 7:8$$

$\therefore$ A's speed = 7x kmph (let)

B's speed = 8x kmph

$\therefore$ AB = 7x × 4 = 28x km.

Let both trains cross each other after 't' hours from 7 a.m.

According to the question,

$$7x(t+2) + 8x \times t = 28x \Rightarrow 7t + 14 + 8t = 28$$

$$\Rightarrow 15t = 28 - 14 = 4$$

$$\Rightarrow t = \frac{14}{15} \text{ hours} = \left(\frac{14}{15} \times 60\right) \text{min.} = 56 \text{ min.}$$

$\therefore$ Required time = 7 : 56 a.m.

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

Volume of conical piece of iron

$$= \frac{1}{3}\pi R^2 h = \left(\frac{1}{3}\pi \times 14 \times 14 \times 30\right) \text{ cu. cm.}$$

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

$$\therefore \pi r^2 \times 6.4 = \frac{1}{3}\pi \times 14 \times 14 \times 30$$

$$\Rightarrow r^2 = \frac{14 \times 14 \times 10}{6.4} \Rightarrow r^2 = \frac{14^2 \times 10^2}{8^2} \Rightarrow r = \frac{14 \times 10}{8}$$

$$\Rightarrow 2r = \frac{2 \times 14 \times 10}{8} = 35 \text{ cm} = \text{diameter}$$

76. (1) Here, some were surprised/ Some categorically denied ... should be used.

77. (3) Here, the speed the ship sailed/travelled at .... should be used.

81. (1) The word **Notion (Noun)** means : belief; desire; intention; tought.

82. (2) The word **Vivacious (Adjective)** means : having a lively, attractive personality; energetic.

Look at the sentence :

He had three pretty vivacious daughters.

83. (2) The word **Forthright (Adjective)** means : frank; direct and honest in manner and speech; candid.

The word **Tricky (Adjective)** means : Clever but likely to trick you, deceive you, deceitful.

84. (1) The word **Antagonism (Noun)** means : hostility; feelings of hatred and opposition; animosity; enmity.

The word **Cordiality (Noun)** means : in a pleasant and friendly manner.

Look at the sentence : The antagonism he felt towards his old enemy was still very strong.

You are cordially invited to the celebration.

85. (2) The word **Vanity (Noun)** means : too much pride in your own appearance, abilities or achievements; arrogance. The word **Humility (Noun)** means : the quality of being humble.

86. (2) Idiom **pay through the nose** means : to pay too much money for something.

87. (2) Idiom **pick holes in something** means : to find the weak points in something such as a plan, suggestion etc.

92. (3) The word **Incantation** means : special words that are spoken or sung to have a magic effect.