> ANSWER KEY

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

HINT & SOLUTIONS

1. **(C)**
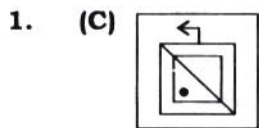
2. **(A)** DEFIANT is antonym of OBEDIENT. Similarly, DEPRAVITY is antonym of **GOODNESS**

3. **(B)** M Neg : GEnm : : **QSla** : ALsq

Small letters become capital letters and capital letters become small letters.

4. **(A)** 01 : 08 : : **9** : 64
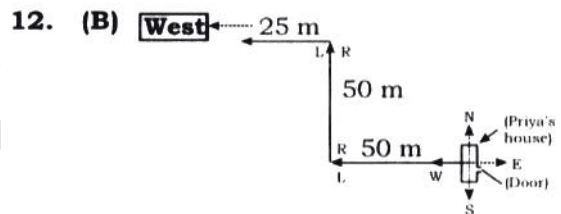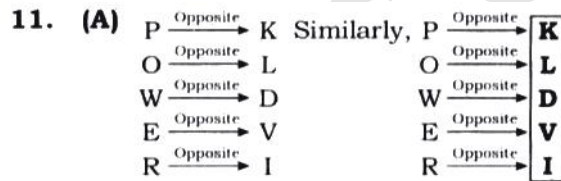1^2 2^3 3^2 4^2
+1 +1
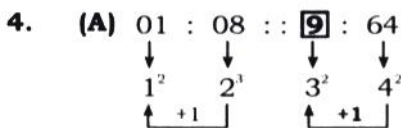
5. **(C)** Guitar, Veena and Sitar produce musical sound through wire but **Flute** produce musical sound through air.

6. **(D)** Only option **'D' (14-28)** second number is completely divisible by first number.

7. **(B)** Except option **'B' (A)**, all are consonant of English Alphabets.

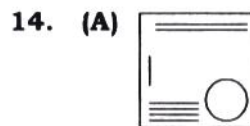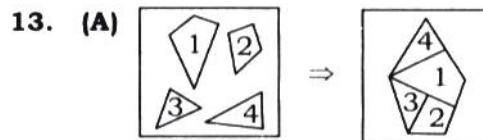**8.** **(D)** ACZXP, BDYYQ, CEXZR, DFWAS, **EGVBT** FHUCU

9. **(C)** 7, 14, 42, 168, **840**
7×2 14×3 42×4 168×5
+1 +1 +1

10. **(D)** ba/dc/ba/dc/ba/dc/ba/dc

11. **(A)**
P —Opposite→ K   Similarly, P —Opposite→ K
O —Opposite→ L   O —Opposite→ L
W —Opposite→ D   W —Opposite→ D
E —Opposite→ V   E —Opposite→ V
R —Opposite→ I   R —Opposite→ I

12. **(B)**
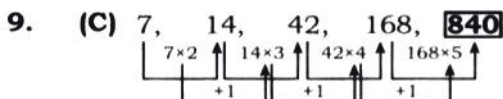
Shortcut:
Priya starts walking towards West.
Hence, W + R̶ + L̶ = W
So, at the end priya is facing towards **West** direction.

13. **(A)**

14. **(A)**

15. **(D)** C O N V U L S I O N
The word **CONVULSION** contains O, V, U and O vowels.

16. **(D)**
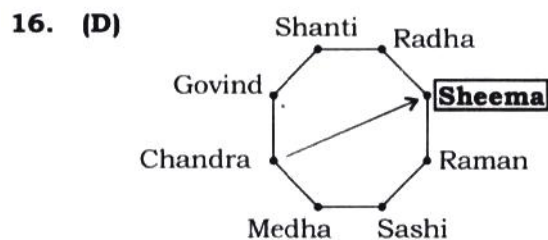
Sheema is the opposite to chandara.

17. **(A)** From the choices.

(A) Interchange ÷ and ×

We get,

$\boxed{5 + 6 \times 3 - 12 \div 2 = 17}$ [Use 'BODMAS' rule]

$5 + 18 - 6 = 17 \Rightarrow 17 = 17$

(B) Interchange ÷ and ×

We get,

$5 \times 6 \div 3 - 12 + 2 = 17$ [Use 'BODMAS' rule]

$10 - 10 = 17 \Rightarrow 0 \neq 17$

(C) Interchange ÷ and ×

We get,

$5 \div 6 + 3 - 12 \times 2 = 17$ [Use 'BODMAS' rule]

$0.83 + 3 - 24 = 17 \Rightarrow -20.17 \neq 17$
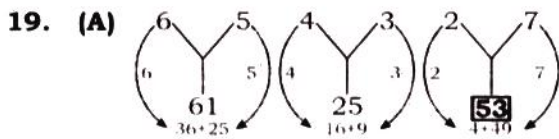
(D) Interchange ÷ and ×

We get,

$5 - 6 \div 3 + 12 \times 2 = 17$ [Use 'BODMAS' rule]

$5 - 2 + 24 = 17 \Rightarrow 3 + 24 = 17 \Rightarrow 27 \neq 17$

18. **(C)**

$\left.\begin{array}{l}2 = 2^2 = 4 \\ 3 = 3^2 = 9 \\ 4 = 4^2 = 16\end{array}\right\}$ + $\quad$ $\left.\begin{array}{l}1 = 1^2 = 1 \\ 4 = 4^2 = 16 \\ 5 = 5^2 = 25\end{array}\right\}$ +

$\overline{29} \leftarrow \quad\quad \boxed{42} \leftarrow$

$\left.\begin{array}{l}3 = 3^2 = 9 \\ 2 = 2^2 = 4 \\ 1 = 1^2 = 1\end{array}\right\}$ +

$\overline{14} \leftarrow$

19. **(A)**

$\boxed{53}$

$61 = 36 + 25$, $25 = 16 + 9$, $53 = 4 + 49$

20. **(A)** $\underset{3}{\text{War}}$ $\quad$ $\underset{1}{\text{Wasp}}$ $\quad$ $\underset{2}{\text{Waste}}$ $\quad$ $\underset{4}{\text{Wrinkle}}$

$\underset{5}{\text{Wrist}}$

Hence, as per English dictionary correct order is $\boxed{31245}$.

21. **(C)** $\underset{3}{\text{Crime}}$ $\quad$ $\underset{1}{\text{Police}}$ $\quad$ $\underset{4}{\text{Judge}}$ $\quad$ $\underset{5}{\text{Jugement}}$

$\underset{2}{\text{Punishment}}$

Hence, the meaningfull order is $\boxed{31452}$.

22. **(A)**
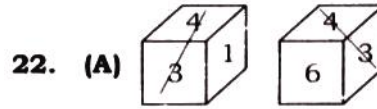
$\overset{1}{\underset{6}{\boxed{}}}$ opposite to each other.

Shortcut:

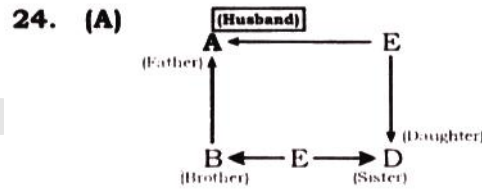If there is two numbers are common in two faces of a dice. Means, third numbers are opposite to each other.

23. **(D)**

$3 \times 3 = 9$
$+$
$3 \times 3 = 9$
$+$
$3 \times 3 = 9$
$\boxed{27}$
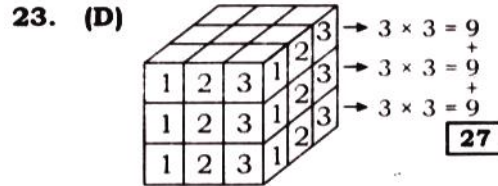
Shortcut:

Total number of small cube = n^3

here n is number of cubes in a row or column.

$n = 3$, So, $n^3 = 3^3 = \boxed{27}$

24. **(A)**

25. **(B)** Solving from the options.

(A) 67, 22, 31, 58, 22

(B) $\boxed{98, 03, 44, 22, 58}$

(C) 75, 03, 11, 22, 76

(D) 86, 40, 23, 14, 96

51. $\dfrac{5 + \sqrt{10}}{5\sqrt{5} - 2\sqrt{20} - \sqrt{32} + \sqrt{50}}$

$= \dfrac{5 + \sqrt{10}}{5\sqrt{5} - 4\sqrt{5} - 4\sqrt{2} + 5\sqrt{2}}$

$= \dfrac{5 + \sqrt{10}}{\sqrt{5} + \sqrt{2}} \times \dfrac{\sqrt{5} - \sqrt{2}}{\sqrt{5} - \sqrt{2}}$

$= \dfrac{5\sqrt{5} - 5\sqrt{2} + 5\sqrt{2} - 2\sqrt{5}}{3}$

$= \dfrac{3\sqrt{5}}{3} = \sqrt{5}$

52. Let, number of persons = x

$\therefore$ Number of 25 paise coins

$= x^2$

$$\therefore \qquad \frac{x^2}{4} = 1600 \Rightarrow x^2 = 6400$$

$$x = 80$$

$\therefore$ Number of persons $= 80$

53. Given

$$A = 2B$$
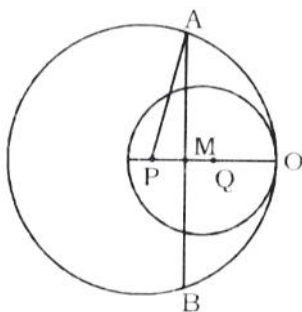
and $\qquad A + B = 3C$

Now

$$\frac{A}{B} = \frac{2}{1}$$

$$\frac{A + B}{C} = \frac{3}{1}$$

So, required ratio of earnings

$$= 2:1:1$$

54.

P and Q are the centres of the circles

$$PQ = 5 - 3 = 2\,\text{cm}$$

$$PM = \frac{PQ}{2} = 1\,\text{cm}$$

In ΔPAM

$$AM = \sqrt{AP^2 - PM^2}$$

$$AM = \sqrt{5^2 - 1^2} = 2\sqrt{6}$$

$$AM = 2M$$

$$= 4\sqrt{6}\ \text{cm}$$

55. $a = 9999$

$$\frac{4a^3 - a}{(2a+1)(6a-3)} = \frac{a(4a^2 - 1)^2}{3(2a+1)(2a-1)}$$

$$= \frac{a(4a^2 - 1)}{3(4a^2 - 1)} = \frac{a}{3}$$

$$= \frac{9999}{3} = 3333$$

56. $\therefore$ **Total rent** $= \dfrac{1152 \times 588}{384}$

$$= 1764$$

57. When we change shape of a solid figure volume remains constant.

$\therefore$ Volume of hemisphere= Volume of cone

$$\frac{2}{3}\pi R^3 = \frac{1}{3}\pi R^2 H$$

$$\therefore \qquad H = 2R$$

58. $\cot 2\theta . \cot 3\theta = 1$

$$(2\theta + 3\theta) = 90^\circ$$

$$5\theta = 90^\circ$$

If $\cot A . \cot B = 1$, then $A + B = 90^\circ$

$$\Rightarrow \qquad 2\sin^2 \frac{5\theta}{2} - 1$$

$$= 2\sin^2 \frac{90^\circ}{2} - 1 = 2 \times \frac{1}{2} - 1 = 0$$

59. Cost price of 7 apples =4

Cost price of 1 apple $\qquad = \dfrac{4}{7}$

For 47% gain Selling price of 1 apple

$$= \frac{4}{7} \times \frac{157}{100}$$

$\therefore$ Selling price of 100 apples

$$= \frac{4}{7} \times \frac{147}{100} \times 100 = 84$$

60. $x - y \neq 0,\ y - z \neq 0$ **and** $z - x \neq 0$

$$x - y = \frac{1}{z} - \frac{1}{y} = \frac{y - z}{zy}$$

$$y - z = \frac{1}{x} - \frac{1}{z} = \frac{z - x}{xz}$$

$$z - x = \frac{1}{y} - \frac{1}{x} = \frac{x - y}{xy}$$

Multiplying equation (i),(ii) and (iii)

$$(x - y)(y - z)(z - x)$$

$$= \frac{(y - z)}{yz}, \frac{(z - x)}{zx}, \frac{(x - y)}{xy}$$

$$1 = \frac{1}{(xyz)^2} \Rightarrow xyz = \pm 1$$

61. $\dfrac{x}{a} = \cos^3 \theta, \dfrac{y}{b} = \sin^3 \theta$

$$\therefore \qquad \left(\frac{x}{a}\right)^{\frac{2}{3}} + \left(\frac{4}{5}\right)^{\frac{2}{3}}$$

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

$$= \cos^2 \theta + \sin^2 \theta = 1$$

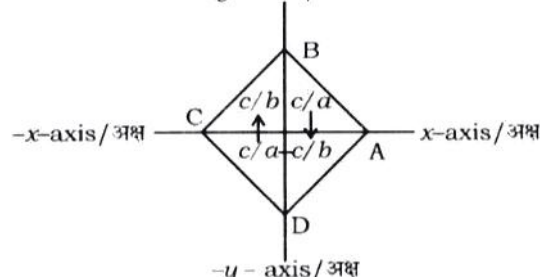**62.** $ax \pm by \pm c = 0$ **will give four lines**

$$ax + by + c = 0$$
$$ax + by - c = 0$$
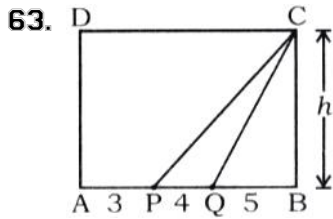$$ax - by + c = 0$$
$$ax - by - c = 0$$

Diagonals $AC \qquad = \dfrac{2c}{a}$

∴ Area of rhombus

$= \frac{1}{2}d_1d_2 = \frac{1}{2} \times \frac{2c}{a} \times \frac{2c}{b} = \frac{2c^2}{ab}$

63.

$\frac{\text{Area of } \Delta PQC}{\text{Area of } \Delta ABCD}$

$\frac{\frac{1}{2}PQK \times h}{AB \times H} = \frac{PQ}{2AB}$

$= \frac{4}{2 \times 12} = \frac{1}{6} = 1:6$

64. **Let the total number of workers**

∴　$15 \times 300 + (x-15)40 = 70x$

$4500 - 600 = 70x - 40x$

$30x = 3900 \Rightarrow x = 130$

∴ Total number of workers　　　　　= 130

65. $P = \text{Difference} \left(\frac{100}{R}\right)^2 \times \left(\frac{100}{300+R}\right)$

$P = 124 \times \left(\frac{100}{10}\right)^2 \left(\frac{100}{300+10}\right)$

$P = 124 \times 100 \times \frac{100}{310} = 4000$

∴ Sum　　　　　　= 4000

66. **Population of Noida = 3,11,250**

Number of women in Noida

$= \frac{311250}{(43+40)} \times 43 = 161250$

Number of literate women

$= 161250 \times \frac{24}{100} = 38700$

Number of men in the Noida

$= \frac{311250}{(43+40)} \times 40$

$= 150000$

Number of literate men in Noida

$= 150000 \times \frac{(100-10)}{100} = 135000$

∴ Number of total literate persons in Noida

$= 38700 + 13500 = 173700$

67. LCM = (15, 20, 25) = 300

Largest 5 digit number　= 99999

Divide 99999 by LCM of given number,

We get remainder　　　= 99

Required number　　　= 99999 − 99 = 99900

68. **Let the time taken by second pipe = x hours**

Time taken by first pipe　= $(x+5)$ hours

Time taken by thrid pipe　= $(x-4)$ hours

∴　　$\frac{1}{(x+5)} + \frac{1}{x} = \frac{1}{(x-4)}$

⇒　　$\frac{x+x+5}{(x^2+5x)} = \frac{1}{(x-4)}$

$x^2 - 8x - 20 = 0$

⇒　　$x^2 - 10x + 2x - 20 = 0$

$(x-10)(x+2) = 0$

$x = 10 \text{ hours}$

∴ Time taken by first pipe = 10 + 5 = 15 hours

69. **Let the distance be x km and usual speed of man be y km**

∴　　$\frac{x}{y} - \frac{x}{y+3} = \frac{40}{60}$

$2y(y+3) = 9x$

And　　$\frac{x}{y-2} - \frac{x}{y} = \frac{40}{60}$
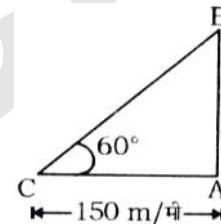
$y(y-2) = 3x$

Divide equation (i) from equation (ii)

$2y + 6 = 3y - 6, y = 12$

$x = 40$

∴ Distance travelled by man

$= 40 \text{ km}$

70.

Let C be the the position of John. Let A be the position at which balloon leaves the earth and B be the position of the balloon after 2 minutes

Given　　　　$CA = 150\text{m}$

$\angle BCA = 60°$

In ΔBAC

$\tan 60° = \frac{BA}{CA}$

⇒　　$\sqrt{3} = \frac{BA}{150}$

$BA = 150\sqrt{3} \text{ m}$

The distance travelled by the balloon

$= 150\sqrt{3} \text{ m}$

Time taken by balloon

$= 2 \times 60 = 120 \text{ seconds}$

∴ Speed of balloon　　$= \frac{150\sqrt{3}}{120}$

71. **Let the angles of a triangle be $4x = 180°$**

⇒　　　　　　$x = 30°$

Angles of triangle are $30°$ and $120°$

It is clear that the triangle is a isosceles triangle

Perimeter of triangle $= a + b = 2a + b$

By using sine rule

$$\frac{b}{\sin 120°} = \frac{a}{\sin 30°}, a = \frac{b}{\sqrt{3}}$$

$\therefore$ Ratio of largest side to the perimeter of triangle

$$= b : 2a + b = b : b\left(\frac{2 + \sqrt{3}}{\sqrt{3}}\right)$$

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

72. **Let the rate of flow of river be x km/hr**

$\therefore$

$$\frac{91}{10 - x} + \frac{91}{10 + x} = 20$$

$$\frac{10 + x + 10 - x}{100 - x^2} = \frac{20}{91}$$

$$\frac{20}{100 - x^2} = \frac{20}{91}$$

$\Rightarrow$ $\qquad 91 = 100 - x^2$

$$x^2 = 9, x = \pm 3$$

$\therefore$ The rate of flow of river $= 3$ km/h

73. **Total debt in 2014 and 2015**

$$= 1320 + 1300 = 2620$$

Total debt in 2008 and 2009

$$= 831 + 894 = 1725$$

Difference $\qquad = 2620 - 1725 = 895$

%increase $\qquad = \frac{985}{1725} \times 100$

$$= 51.89 \approx 52\%$$

74. **Average debt of last five years**

$$= \frac{1051 + 1152 + 1281 + 1320 + 1300}{5}$$

$$= \frac{6104}{5} = 1229.8$$

Average debt of first three years

$$= \frac{831 + 894 + 933}{3} = \frac{2658}{3} = 886$$

Difference of debt between these years

$$= 1220.8 - 886 = 334.8$$

75. **The average debt of 8 years**

$$= \frac{831 + 894 + 933 + 1051 + 1152 + 1281 + 1320 + 1300}{8}$$

$$= \frac{6990}{8} = 873.75$$

$\therefore$ Required number of years = one