

> ANSWER KEY

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

HINT & SOLUTIONS

31. Ratio of capital

$$= 30000 \times 12 : (24000 \times 4 + 18000 \times 8) : (42000 \times 4 + 32000 \times 8)$$

$$= 36000 : (96000 + 144000) : (168000 + 256000)$$

$$= 360000 : 240000 : 424000$$

$$= 360 : 240 : 424 = 45 : 30 : 53$$

Sum of ratios = 45 + 30 + 53 = 128

$$\text{Now, B's share} = \frac{30}{128} \times 11960 = ₹2803.125 \approx ₹2803$$

32. Here the edge of an ice cube is 14 cm.

$$\text{Radius of the cylinder} = \frac{14}{2} = 7 \text{ cm}$$

$$\text{Height of the cylinder} = 14 \text{ cm}$$

$$\therefore \text{Volume of the largest cylinder} = \pi r^2 h$$

$$= \frac{22}{7} \times 7 \times 7 \times 14 = 2156 \text{ cu cm}$$

33. Let the sum lent at 6% rate of interest be ₹x.

Then, ₹(1680 - x) is lent at 8% rate of interest.

$$\text{Then, SI} = 19000 - 16800 = ₹2200$$

$$\frac{x \times 6 \times 2}{100} + \frac{(16800 - x) \times 2 \times 8}{100} = 2200$$

$$\text{or, } 12x + 268800 - 16x = 2200 \times 100$$

$$\text{or, } 268800 - 220000 = 4x$$

$$\text{or, } x = \frac{48800}{4} = ₹12200$$

34. Kapil's present age = (8 + 5) = 13 years

$$\text{Kapil's age after 6 years} = 13 + 6 = 19 \text{ years}$$

$$\text{Now, Romila's father's age} = 2 \times \text{Kapil's age} = 2 \times 19 = 36 \text{ years}$$

$$\text{Father's present age} = 38 - 6 = 32 \text{ years}$$

$$\text{Romila's present age} = \frac{1}{4} \times \text{father's present age}$$

$$= \frac{1}{4} \times 32 = 8 \text{ years}$$

35. Let the number of students be 100. Number of students who failed in Hindi is 30%.

$$n(H) = 30$$

Number of students who failed in English is 45%

$$\therefore n(E) = 45$$

Number of students who failed in both the subjects is 20%

$$n(H \cap E) = 20$$

Applying the rule,

$$n(H \cup E) = n(H) + n(E) - n(H \cap E)$$

$$= 30 + 45 - 20 = 55$$

Percentage of students who failed in Hindi or English or both the subjects = 55%

$$\text{Number of students who passed in both the subjects} = 100 - 55 = 45\%$$

$$36. \text{ Part of tank emptied in 1 hour by the leak} = \frac{1}{2} - \frac{3}{7} = \frac{1}{14}$$

The leak will empty the tank in 14 hours.

37. Speed of man from P to Q = 40 kmph

$$\text{Speed of man from Q to P} = \frac{40 \times 150}{100} = 60 \text{ kmph}$$

$$\therefore \text{Average speed} = \frac{2 \times 40 \times 60}{40 + 60} = 48 \text{ kmph}$$

$$38. \text{ Loss \%} = \left(\frac{\text{Common gain or loss}}{10} \right)^2$$

$$= \frac{144}{100} = \frac{36}{25} = 1 \frac{11}{25} \%$$

Quicker Method:

$$12 - 12 - \frac{12 \times 12}{100} = -\frac{144}{100} = -\frac{36}{25} = -1 \frac{11}{25} \%$$

Negative sign shows loss.

$$39. \begin{array}{cccccccc} 3601 & 3602 & 1803 & 604 & 155 & 36 & 12 \\ \hline +1+1 & +2+2 & +3+3 & +4+4 & +5+5 & +6-6 & \end{array}$$

154 is written in place of 155.

$$40. \begin{array}{cccccccc} 4 & 12 & 45 & 196 & 1005 & 6066 & 42511 \\ \hline \times 2+(2)^2 & \times 3+(3)^2 & \times 4+(4)^2 & \times 5-(5)^2 & \times 6-(6)^2 & \times 7+(7)^2 & \end{array}$$

42 is written in place of 45.

$$41. \begin{array}{cccccc} 2 & 6 & 12 & 20 & 30 & 42 & 56 \\ \hline +4 & +6 & +8 & -10 & +12 & -14 & \end{array}$$

8 is written in place of 6.

$$42. \begin{array}{cccccc} 32 & 16 & 24 & 60 & 210 & 945 & 5197.5 \\ \hline \times 0.5 & \times 1.5 & \times 2.5 & \times 3.5 & \times 4.5 & \times 5.5 & \end{array}$$

65 is written in place of 60.

$$43. \begin{array}{cccccc} 7 & 13 & 25 & 49 & 97 & 193 & 385 \\ \hline +6 & +12 & +24 & +48 & -96 & +192 & \end{array}$$

194 is written in place of 193.

44. **Second train covers the 120 kms more distance only because of its exceed speed of**

$$\Rightarrow \text{Time, taken by trains to meet each other} \\ = \frac{90 \text{ kms}}{10 \text{ km/h}} = 9 \text{ hrs}$$

$$\text{Distance covered by first} = 9 \times 50 = 450 \text{ km}$$

$$\text{Distance covered by the second train} \\ = 9 \text{ hrs} \times 60 \text{ kmph} \\ = 540 \text{ km}$$

Total distance between A and B

$$540 + 450 = 990 \text{ km}$$

45. **Speed of the boat in still water = 10 km/h**

Speed of the stream = 4 km/h

\therefore Down stream = 14 km/h

Upstream speed = 6 km/h

Let distance = M km

$$\frac{M}{14} + \frac{M}{6} = 5 \text{ hours} \\ \frac{3M + 7M}{42} = 5, 10M = 42 \times 5 \\ M = \frac{42 \times 5}{10} = 21 \text{ km}$$

$$46. ? = 21 + 3.9 \times 2.9 + 8.99 \approx 21 + 4 \times 3 = 21 + 12 + 9 = 42$$

$$47. 22.9889 \div ? = 23$$

$$\text{or, } \frac{23}{?} = 23 \text{ or, } ? = \frac{23}{23} = 1$$

$$48. ? = \sqrt{1000000.000001} \approx \sqrt{1000 \times 1000} = 1000$$

$$49. ? = \frac{134 \times 3894}{100} + 38.94 \times 134$$

$$= 38.94 \times 134 + 38.94 \times 134 \\ \approx 2 \times (39 \times 134) = 78 \times 134 = 10452$$

$$50. 10^2 + 10^2 = 10^3 \times 100^3 + 999999999$$

$$= 10^3 \times 10^6 + 1000000000$$

$$= 10^9 + 10^9$$

$$\text{or, } 2 \times 10^9 = 2 \times 10^9 \quad \therefore ? = 9$$

51. **Male employees**

$$\text{In Company A} \rightarrow 760 \times \frac{13}{19} = 520$$

$$\text{In Company B} \rightarrow 840 \times \frac{4}{7} = 480$$

$$\text{In Company C} \rightarrow 720 \times \frac{7}{15} = 336$$

$$\text{In Company D} \rightarrow 640 \times \frac{9}{20} = 288$$

$$\text{In Company E} \rightarrow 700 \times \frac{23}{35} = 460$$

$$\therefore \text{Total number of male employees} = 520 + 480 + 336 \\ + 288 + 460 = 2084$$

52. **Female employees**

$$\text{In Company A} \rightarrow 760 \times \frac{6}{19} = 240$$

$$\text{In Company B} \rightarrow 840 \times \frac{3}{7} = 360$$

$$\text{In Company C} \rightarrow 720 \times \frac{8}{15} = 384$$

$$\text{In Company D} \rightarrow 640 \times \frac{11}{20} = 352$$

$$\text{In Company E} \rightarrow 700 \times \frac{12}{35} = 240$$

$$\therefore \text{Average} = \frac{240 + 360 + 384 + 352 + 240}{5}$$

$$= \frac{1576}{5} = 315.2 \approx 315$$

53. **Male employees in Company A and C = 520 + 336 = 856**

Female employees in Company B and D

$$= 360 + 352 = 712$$

$$\therefore \text{Difference} = 856 - 712 = 144$$

$$54. \text{Reqd ratio} = \frac{352}{240} = 22 : 15$$

$$55. \text{Reqd \%} = \frac{720 - 640}{640} \times 100 = \frac{80}{640} \times 100 = 12.5\%$$

$$56. \text{I. } x^2 - 24x + 144 = 0$$

$$\text{or, } x^2 - 12x - 12x + 144 = 0$$

$$\text{or, } x(x - 12) - 12(x - 12) = 0$$

$$\text{or, } (x - 12)^2 = 0$$

$$\therefore x = 12$$

$$\text{II. } y^2 - 26y + 169 = 0$$

$$\text{or, } y^2 - 13y - 13y + 169 = 0$$

$$\text{or, } y(y - 13) - 13(y - 13) = 0$$

$$\text{or, } (y - 13)^2 = 0$$

$$\therefore y = 13$$

Hence, $x < y$

$$57. \text{I. } 2y^2 + 3x - 20 = 0$$

$$\text{or, } 2x^2 + 8x - 5x - 20 = 0$$

$$\text{or, } 2x(x + 4) - 5(x + 4) = 0$$

or, $(2x-5)(x+4)=0$

or, $x = \frac{5}{2}, -4$

II $2y^2+19y+44=0$

or, $2y^2+11y+8y+44=0$

or, $2y(2y+11)+4(2y+11)=0$

or, $(y+4)(2y+11)=0$

$y = -4, -\frac{11}{2}$ Hence, $x \geq y$

58. I $6x^2+77x+121=0$

or, $6x^2+66x+11x+121=0$

or, $6x(x+11)+11(x+11)=0$

or, $(6x+11)(x+11)=0$

or, $x = -\frac{11}{6}, -11$

II $y^2+9y-22=0$

or, $y^2+11y-2y-22=0$

or, $y(y+11)-2(y+11)=0$

or, $(y-2)(y+11)=0$

or, $y = 2, -11$

Hence, no relationship can be established between x and y .

59. I $x^2-6x=7$

or, $x^2-6x-7=0$

or, $x^2-7x+x-7=0$

or, $x(x-7)+1(x-7)=0$

or, $(x+1)(x-7)=0$

or, $x = -1, 7$

II $2y^2+13y+15=0$

or, $2y^2+10y+3y+15=0$

or, $2y(y+5)+3(y+5)=0$

or, $(2y+3)(y+5)=0$

or, $y = -\frac{3}{2}, -5$ Hence, $x > y$

60. I $10x^2-7x+1=0$

or, $10x^2-5x-2x+1=0$

or, $5x(2x-1)-1(2x-1)=0$

or, $(5x-1)(2x-1)=0$

or, $x = \frac{1}{5}, \frac{1}{2}$

II $35y^2-12y+1=0$

or, $35y^2-7y+5y+1=0$

or, $7y(5y-1)-1(5y-1)=0$

or, $(7y-1)(5y-1)=0$

or, $y = \frac{1}{7}, \frac{1}{5}$

Hence, $x \geq y$

61. Total number of students studying Arts in Institutes A and G together

$= 3800 \times \frac{(15+12)}{100} = 3800 \times \frac{27}{100} = 1026$

62. Number of students studying Art in Institute

$B = 3800 \times \frac{8}{100} = 304$

Number of students studying Commerce in Institute

$B = 4200 \times \frac{17}{100} = 714$

\therefore Total number of students = $304 + 714 = 1018$

63. Number of students studying Arts in Institute

$E = 3800 \times \frac{14}{100} = 532$

Number of students studying Commerce in Institute

$E = 4200 \times \frac{18}{100} = 756$

\therefore Reqd ratio = $532 : 756 = 19 : 27$

64. Number of students studying Arts in Institute E = 532

Number of students studying Commerce in Institute

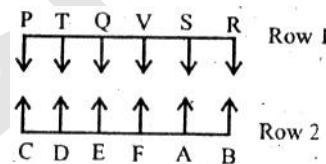
$D = 4200 \times \frac{14}{100} = 588$

\therefore Reqd ratio = $\frac{532}{588} = 19 : 21$

65. Total number of students studying Commerce in Institute B and D together

$= 4200 \times \left(\frac{17+14}{100} \right) = 42 \times 31 = 1302$

66 to 71



66. (c) 67. (e) 68. (b) 69. (a) 70 (e) 71. (d)

72. All digits are alphabets (A) + No alphabet is a vowel (E) = A + E = E = No digit is a vowel. Hence, conclusion I follows.

No alphabet is a vowel \rightarrow conversion \rightarrow No vowel is an alphabet.

Now, All consonants are vowels (A) + No vowel is an alphabet (E) = A + E = E = No consonant is an alphabet (E) \rightarrow conversion \rightarrow No alphabet is a consonant. Hence, conclusion II follows.

Again, Some numbers are digits + All digits are alphabets = I + A = I = Some numbers are alphabets (I) + No alphabet is a vowel (E) = I + E = O = Some numbers are not vowels. Hence, conclusion III and IV do not follow.

73. All documents are files (A) + Some files are papers (I) = A + I = No conclusion. Hence, conclusion I, II and IV do not follow. However, I and conversion of IV make a complementary pair. Hence, either I or IV follows. Again Some files are papers (I) + All papers are certificates (A) = I + A = I = Some files are certificates \rightarrow conversion \rightarrow Some certificates are files. Hence, conclusion III follows.

74. All people are animals (A) + All animals are plants (A) = A + A = A = All people are plants. Hence, conclusion

II follows. Now, No group is people (E) + All people are plants (A) = E + A = O* = Some plants are not groups. Thus, conclusion I, III and IV do not follow. However, I and III make a complementary E-I pair. Hence, either I or III follows.

75. All jobs are works → implication → Some works are jobs. Hence, conclusion I follows.

Again, Some jobs are vacancies → conversion → Some vacancies are jobs + All jobs are works (A) = I + A = I = Some vacancies are works (I) + No work is a trade (E) = I + E = O = Some vacancies are not trades. Hence, conclusion II does not follow.

Now, No work is a trade → Conversion → No trade is a work

Again, All professions are trades (A) + No trade is a work (E) = A + E = E = No profession is a work. Hence, conclusion III follows. But conclusion IV does not follow.

76. No grade is a score → conversion → No score is a grade. Now, All letters are scores (A) + No score is a grade (E) = A + E = E = No letter is a grade. Hence, conclusion I does not follow. And conclusion II does not follow from statement II.

Again, All marks are grades (A) + No grade is a score (E) = A + E = E = No mark is a score (E) + All scores are characters (A) = E + A = O* = Some characters are not marks. Hence, conclusion III does not follow. But All letters are scores (A) + All scores are characters (A) = A + A = A = All letters are characters → conversion → Some characters are letters. Hence, conclusion IV follows.

77 to 81

Given © → ≤, # → <, @ → =, □ → >, \$ → ≥

77. Given statement: A > N ... (i)
 S ≥ N ... (ii)
 S > W ... (iii)
 W ≤ R ... (iv)

Combining all these statements

$$A > N \leq S > W \leq R$$

Thus, we can't compare R and A. Hence I is not true.

78. Given statements: D < E ... (i)
 E ≤ T ... (ii)
 T = C ... (iii)
 C < A ... (iv)

Combining all these statements, we get

$$D < E \leq T = C < A$$

Thus, D < A is true. Hence, I is true.

Again, D < C is true. Hence, II (C ≤ D) is not true.

E < A or A > E is true. Hence, III is true.

And T < A is true. Hence IV is true.

79. Given statements: O ≥ B ... (i)
 B = S ... (ii)
 S < E ... (iii)
 E ≤ R ... (iv)

Combining all these statements, we get

$$O \geq B = S < E \leq R$$

Thus, O ≥ S or S ≤ O is true. Hence, conclusion I is true. Again, S < R or R > S is true. Hence, conclusion II is true. B < R is true. Hence, conclusion III is true. And B < E is true. Hence, conclusion IV is true.

80. Given statements: D ≤ S ... (i)
 S > P ... (ii)
 P ≥ I ... (iii)
 P = T ... (iv)

Combining all these statements, we get

$$D \leq S > P = T \geq I$$

Thus, we can't compare P and D, or I and D. Hence, conclusions I and IV are not true. Again, P = T is true. Hence, conclusion II (P ≥ T) is not true. And S > T or T < S is true. Hence, conclusion III is true.

81. Given statements: U = N ... (i)
 N ≥ F ... (ii)
 F ≥ A ... (iii)
 A > R ... (iv)

Combining all these statements, we get

$$U = N \geq F \geq A > R$$

Thus N > R is true. Hence, conclusion II is true. Again U > R is true.

U ≥ A means either U > A or U = A. Hence, either I or IV follows.

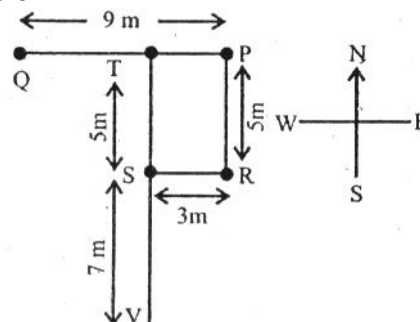
84 to 88

Day	Subject
Mon	Physics
Tues	Botany
Wed	Maths
Thurs	Chemistry
Fri	Statistics
Sat	Zoology
Sun	English

84. (a) 85. (d) 86. (c) 87. (d) 88. (b)

89. Only son of woman's grand-father = woman's father
 Man's brother's father = Man's Father
 So man's father is woman's father woman is a sister of man

90 to 91



90. (d) 91. (e)

92 to 95

ze lo ka gi = must save some money ... (i)

fe ka so ni = he made good money ... (ii)

ni lo da so = he must be good ... (iii)

we so ze da = be good save grace ... (iv)

From (i) and (iii), lo = must ... (v)

From (i) and (iv), ze = save ... (vi)

From (ii), (iii) and (iv), so = good ... (vii)

From (i) and (ii), ka = money ... (viii)

From (i), (v), (vi) and (viii), gi = some ... (ix)

From (ii), (iii) and (vii), ni = he ... (x)

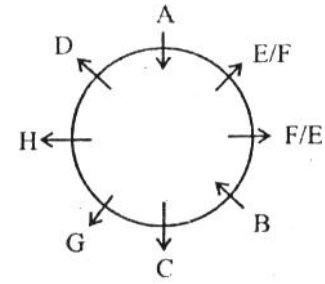
From (ii), (vii), (viii) and (x), fe = made ... (xi)

From (iii), (v), (vii) and (x), da = be ... (xii)

From (iv), (vi), (vii) and (xii), we = grace ... (xiii)

92. (c) 93. (e) 94. (a) 95. (d)

96 to 100



96. (b) 97. (d) 98. (a) 99. (e) 100. (c)