3. 2; $\because \sqrt{24000} \approx 155$

$\therefore$? $\approx 155 \times 36 + 175 \times 4 = 5580 + 700 = 6280$

4. 3; $\because \sqrt{1935} = 44$

$\therefore$? $= \frac{4488}{44} + \frac{172}{4} = 102 + 43 = 145$

5. 3; ? $= \frac{1884 \times 73}{100} \div 25 \approx \frac{1375}{25} = 55$

6. 5; The series is $+17^2 - 17$, $+15^2 - 15$, $+13^2 - 13$ ...

7. 3; The series is $+8^3$, $+12^3$, $+16^3$, $+20^3$, ...

8. 2; The series is $2^2 + 4^2$, $6^2 + 8^2$, $10^2 + 12^2$, $14^2 + 16^2$ ...

9. 1; The series is -24^2, -21^2, -18^2, -15^2 ...

10. 3; The series is $+10^3 - 10$, $9^3 - 9$, $+8^3 - 8$ ...

11. 5; **I.** $x = \sqrt[3]{357911}$ $\therefore x = 71$

II. $y = \sqrt{5041}$ $\therefore y = 71$

$\therefore x = y$

12. 1; $\text{Eqn (I)} \times 9 - \text{Eqn (II)} \times 5$

$$\begin{array}{r} 45x + 63y = -387 \\ 45x - 85y = 205 \\ - \quad + \quad - \\ \hline 148y = -592 \end{array}$$

$\therefore y = -4$ and $x = -3$

$\therefore x > y$

13. 4; **I.** $x^2 + 11x + 30 = 0$

or $x(x + 5) + 6(x + 5) = 0$

or $(x + 5)(x + 6) = 0$

$\therefore x = -5, -6$

II. $y^2 + 4y + 5y + 20 = 0$

or $y(y + 4) + 5(y + 4) = 0$

or $(y + 4)(y + 5) = 0$

$\therefore y = -4, -5$

$\therefore x \leq y$

14. 3; **I.** $4x^2 + 4x - x - 1 = 0$

or $4x(x + 1) - 1(x + 1) = 0$

or $(4x - 1)(x + 1) = 0$

$\therefore x = -1, \frac{1}{4}$

II. $6y^2 - 3y - 2y + 1 = 0$
or $3y(2y - 1) - 1(2y - 1) = 0$
or $(3y - 1)(2y - 1) = 0$

$\therefore y = \frac{1}{2}, \frac{1}{3}$

$\therefore x < y$

15. 2; **I.** $3x^2 + 9x + 6x + 18 = 0$
or $3x(x + 3) + 6(x + 3) = 0$
or $(x + 3)(3x + 6) = 0$
$\therefore x = -3, -2$
II. $2y^2 + 6y + 9y + 27 = 0$
or $2y(y + 3) + 9(y + 3) = 0$
or $(2y + 9)(y + 3) = 0$

$\therefore y = -3, -\frac{9}{2}$

$\therefore x \geq y$

16. 2; The total number of selected students in State B = 75 + 72 + 104 + 112 + 60 + 75 = 498

$\therefore$ Average = $\frac{498}{6} = 83$

The total number of selected students in
State D = 95 + 84 + 77 + 78 + 64 + 58 = 456

$\therefore$ Average = $\frac{456}{6} = 76$

$\therefore$ Difference = 83 – 76 = 7

17. 3; Percentage of candidates passed in

State A = $\frac{780}{5600} \times 100 = 13.92\%$

Percentage of candidates passed in State B = $\frac{480}{7500} \times 100 = 6.4\%$

Percentage of candidates passed in State C = $\frac{800}{4800} \times 100 = 16.66\%$

Percentage of candidates passed in State D = $\frac{700}{7500} \times 100 = 9.33\%$

18. 2; Total number of students selected in State C = 80 + 60 + 66 + 55 + 52 + 60 = 373
Total number of students selected in State A = 80 + 120 + 72 + 96 + 64 + 68 = 500
$\therefore$ Reqd % = $\frac{373}{500} \times 100 = 74.6\%$

19. 2;

Percentage of selected candidates in State D in 2006 $\rightarrow \frac{95}{700}\times 100 = 13.57\%$

Percentage of selected candidates in State D in 2007 $\rightarrow \frac{84}{540}\times 100 = 15.5\%$

Percentage of selected candidates in State D in 2008 $\rightarrow \frac{77}{660}\times 100 = 11.6\%$

Percentage of selected candidates in State D in 2009 $\rightarrow \frac{78}{720}\times 100 = 10.83\%$

Percentage of selected candidates in State D in 2010 $\rightarrow \frac{64}{640}\times 100 = 10\%$

Percentage of selected candidates in State D in 2011 $\rightarrow \frac{58}{500}\times 100 = 11.6\%$

20. 5; Total candidates passed in State A in 2006 = 780
Total candidates passed in State C in 2009 = 500

$\therefore$ Reqd % = $\frac{(780-500)}{500}\times 100 = \frac{280}{5} = 56\%$

21. 4; Let the sum lent be ₹x.
Then,
Interest = $\frac{x\times 8\times 8}{100}$
Now,

$\therefore \; x - \frac{64x}{100} = 612$

or, 36x = 61200
$\therefore$ x = ₹1700

22. 3; Let the amount be x.

$CI = x\left[1+\frac{15}{100}\right]^2 - x = x\left[\left(\frac{23}{20}\right)^2 - 1\right] = x\left(\frac{129}{400}\right)$

$SI = \frac{x\times 15\times 2}{100} = \frac{3x}{10}$

$\therefore \; \frac{SI}{CI} = \frac{3x}{10}\times\frac{400}{129x} = \frac{40}{43}$

$\therefore \; SI = \frac{40}{43}\times 193.5 = ₹180$

23. 2; Area of the park $= \frac{(968)^2}{4\left(\frac{22}{7}\right)} = 74536 \text{ sq m}$

$\therefore$ Radius of the park = $\sqrt{\frac{74536 \times 7}{22}}$ = 154 m

$\therefore$ Area of the road = $\pi b\,(b + 2r)) = \frac{22}{7} \times 2.8 \times (2.8 + 308)$ = 22 × 0.4 × 310.8 = 2735.04 sq m

24. 5; Required number of ways = ${}^{6}C_{1} \times {}^{5}C_{3} = 6 \times 10 = 60$ ways

25. 1; Total balls = 6 + 7 + 8 = 21

$n(s) = {}^{21}C_{3} = 1330$

Two blue balls can be selected from 7 blue balls in ${}^{7}C_{2} = 21$ ways and the remaining one ball can be selected from the remaining 14 balls in ${}^{14}C_{1} = 14$ ways

$\therefore$ n(E) = 21 × 14 = 294

$\therefore$ P(E) = $\frac{294}{1330} = \frac{147}{665}$

26. 4; Let 10 years ago the ages of A, B and C be x, 3x and 7x respectively. Then the present ages of A, B and C are (x + 10), (3x + 10) and (7x + 10) respectively.

$\therefore$ Sum = 11x + 30 = 85

$\therefore$ 11x = 55 $\therefore$ x = 5

Hence, the present ages of A, B and C are 15, 25 and 45 years respectively.

$\therefore$ Reqd % = $\frac{45}{25} \times 100 = 180\%$

27. 4; Let the daily earnings of the men and women be x and y respectively.

$\therefore$ 13x + 12y = $\frac{11120}{8} = 1390$ ... (i)

$\therefore$ 9x + 11y = $\frac{12840}{12} = 1070$ ... (ii)

Solving eqn (i) and (ii), we get

x = 70 y = 40

$\therefore$ 8x + 15y = 1160

$\therefore$ Required days = $\frac{17400}{1160} = 15$ days

28. 3; Time taken to fill the tank by both the pipes = $\frac{40 \times 10}{40 + 10} = 8$ hours. So to fill the tank half, they will take 4 hours. After leakage half of the water leaks out, that is with leakage the pipes will fill the tank in 16 hours.

But here $\frac{1}{2}$ of the tank is already filled in 4 hours. So, the remaining half will be filled in $\frac{16}{2}$ = 8 hours.

$\therefore$ Total time = 4 + 8 = 12 hours.

29. 5; Let the train meet x km from station X.

($\therefore$ 1PM – 11AM = 2h)

or, $\frac{x}{40} - \frac{(1040 - x)}{80} = 2$

$2x - 1040 + x = 160$, or, $3x = 1200$

$\therefore x = 400$ km

So, time taken by the first train = $\frac{400}{40}$ = 10 hours.

So they will meet at 9pm.

30. 2; Let the side of the square ABCD (park) be x. So area = x^2

Side of square $A_1 B_1 C_1 D_1 = x + 2 + 2 = (x + 4)$ metres

Area of $A_1 B_1 C_1 D_1 = (x + 4)^2$

Area of path = Area of $A_1 B_1 C_1 D_1$ – Area of ABCD

or $(x + 4)^2 - x^2 = 184$

or $x^2 + 8x + 16 - x^2 = 184$

or $8x = 184 - 16 = 168$

$\therefore x = 21$ metres

$\therefore$ Area of the park = $x^2 = 441$ sq m

31. 2; Income of Company A in 2007

$$I = E \times \frac{(100 + P)}{100}$$

or $E = \frac{100 \times I}{(100 + P)} = \frac{85.8 \times 100}{(100 + 32)} = \frac{8580}{132} = 65$ lakh

32. 4; Company A's income in 2012 = Expenditure $\times \frac{(\%\,\text{Profit} + 100)}{100}$

$\therefore I = 90.6 \times \frac{155}{100} = 140.43$ lakh

33. 2; Company B's percentage profits in different years are as follows

% Profit in 2007 $\rightarrow \frac{32 - 25}{25} \times 100 = 28\%$

% Profit in 2009 $\rightarrow \frac{45 - 30}{30} \times 100 = 50\%$

% Profit in 2010 $\rightarrow \frac{50 - 45}{45} \times 100 = 11.11\%$

% Profit in 2011 $\rightarrow \frac{60 - 50}{50} \times 100 = 20\%$

34. 5; We can't find the exact value of the net profit from the given data.

35. 4; $E_A = I_B = 84$ lakhs

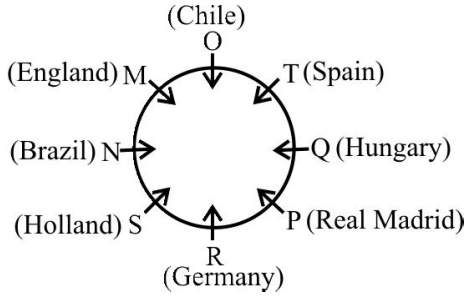
Percentage profit of Company A = 30% Percentage profit of Company B = 50%

$I_A = E_A \times \frac{100 + P_A}{100} = 84 \times \frac{130}{100} = 109.2$ lakhs $\qquad E_B = I_B \times \frac{100}{(100 + P_B)} = 84 \times \frac{100}{150} = 56$ lakhs

$\therefore$ Difference = 109.2 – 56 = 53.2 lakhs

36. 5; 'fo' or 'gm'

37. 4 **38.** 3 **39.** 4 **40.** 1



41. 1 **42.** 5 **43.** 3 **44.** 5 **45.** 1

46. 5; Conclusion I is inherent in the first statement.
Again,
All dogs are kittens (A) + No kittens are black (E) = A + E = E = No dog is black
Hence, conclusion II follows.

47. 1; There is no negative statement. Hence, Conclusion I follows. But conclusion II is a negative conclusion. Hence, II does not follow.

48. 5; All scholar are eccentric (A) + Conversion of No woman is eccentric → conversion → No woman is a scholar.
Hence, conclusion I follows.
Again, All scholars are eccentric (A) + All eccentrics are studies (A) = A + A = A. All scholars are studies. It means. All studies being scholar is a possibility. Hence, conclusion II follows.

49. 3; Some eggs are hard-boiled → conversion → Some hard-boiled are eggs (I) + No eggs are uncrackable (E) = I + E = O = Some hard-boiled are not uncrackable.
But, conclusion I and II make a complementary pair (I–E).

50. 1; All perfumes are expensive (A) + All expensive things are unique (A) = A + A = All perfumes are unique.
Hence, All unique thing being perfumes is a possibility.
Thus, conclusion I follows. But II does not follow.

(51-55):

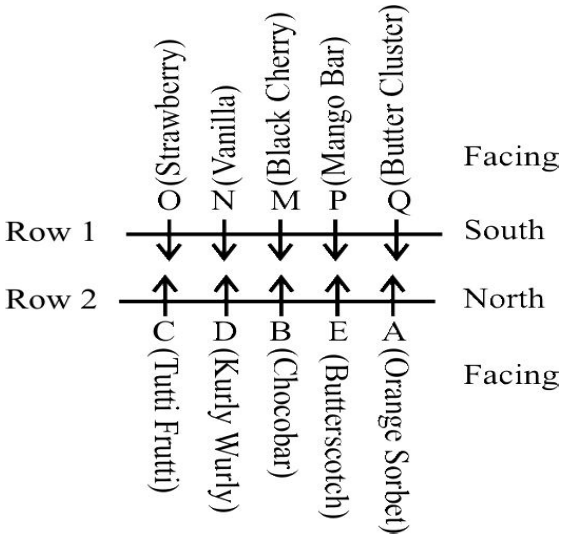
Q > P > N .....(I)
↓
80%

Q > P > N > O > M
↓ ↓ ↓
97% 80% 75%

51. 2

52. 2; Because P lies between the one who scored 97% marks and the one who scored 80% marks.

53. 5 **54.** 5 **55.** 2



56. 4 **57.** 2 **58.** 5 **59.** 2 **60.** 3

61. 4;

From I M _ _ _ R _ ...(a)

_ M _ _ _ R ...(b)

From II M _ N _ R E ...(a)

M N _ _ R E ...(b)

A N ...(c)

From III. U R E

Now, from I and III. M _ _ U R E

Now, combining this with II (c), we get MANURE.

62. 5; Both 'friends' and 'are' are common to all the statements.

63. 5; **From I.**

Friend	Pen colour	Class
M	Yellow / Black / Blue	VII
N		
O		
P		
Q		
R	Green	IV
S	Silver	II

From II.

O – Black – does not study in VI or III.

From III.

P – Blue – V

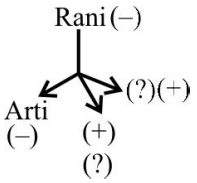
Q does not study in III and N does not like Red pen.

From (I), (II) and (III).

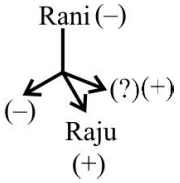
Friend	Pen colour	Class
M	Yellow	VII
N	Pink	III/VI/VIII
O	Black	III/VIII
P	Blue	V
Q	Red	VI/VIII
R	Green	IV
S	Silver	II

Thus, even (I), (II) and (III) together are not sufficient to answer the question.

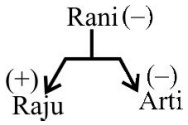
64. 3; **From I.**



From II.

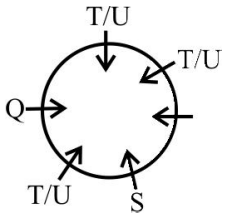


From III.

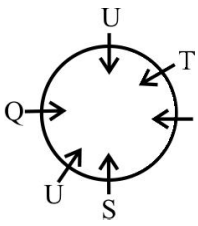


65. 4;

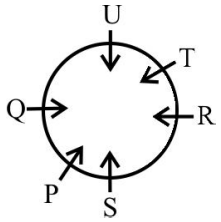
From I.



From I and II.



From (I), (II) and (III).



Thus, (I), (II) and (III) are sufficient to answer the question.

66. 2; D = T ≥ M < J

From the given expression

$\underbrace{D = T \geq M < J}$

D and J cannot be combined. So, I is not true.

From the given expression

$\underbrace{D = T \geq M}_{\text{combining}} < J$

D ≥ M. So, II is true.

67. 3; 8 < K = N ≥ R

From the given expression

$8 < \underbrace{K = N \geq R}_{\text{combining}}$

R = K

Which means either I (R = K)
or II (R < K) is true.

68. 1; Given, H ≥ F < W = E

From the given expression

$H \geq \underbrace{F < W = E}_{\text{combining}}$

E > F. So, I is true.

From the given expression, $\underbrace{H \geq F < W}_{\text{combining}} = E$

We cannot compare H and W. Thus, II is not true.

69. 4; Given, Z > D ≤ K > M

From the given expression,

$Z > \underbrace{D \leq K > M}_{\text{combining}}$

M and D cannot be compared. Thus, I is not true.
From the given expression,

$\underbrace{Z > D \leq K}_{\text{combining}} > M$

Z and K cannot be compared. Thus, II is also not true.

70. 5; Given, $W \le B < N \le F$
From the given expression,

$$W \le \underbrace{B < N \le F}_{\text{combining}}$$

F > B. Thus, I is true.
From the given expression,

$$\underbrace{W \le B < N}_{\text{combining}} \le F$$

W < N. Thus, II is also true.

71. 4	**72.** 3	**73.** 2	**74.** 4	**75.** 5
76. 1	**77.** 3	**78.** 2	**79.** 3	**80.** 2
81. 4	**82.** 3	**83.** 5	**84.** 2	

85. 2; Replace 'from' with 'by'

86. 3; add 'him' after 'stop'

87. 2; Replace 'that' with 'those'

88. 3; Add 'of' after 'instead'

89. 2; Add 'own' after 'one's

(90-94): BFDAEC

90. 2	**91.** 4	**92.** 1	**93.** 5	**94.** 3
95. 1	**96.** 3	**97.** 2	**98.** 4	**99.** 1
100. 2				