IBPS RRB

PO Prelim Exam 2019

(Based On Memory)

Max. Marks : 100 **Time : 1 Hrs.**

REASONING ABILITY

DIRECTIONS (Qs. 1-5): *Study the following information carefully and answer the questions given below:*

Nine persons i.e Rahul, virat, MS dhoni, Rohit, Shikhar, Ravindra, Arav, Mohit, Mukesh were born on different months i.e. January, March, April, May, July, August, September, October, November but not necessarily in same order.

Four persons were born between Rahul and Shikhar. Rahul was born before Shikhar. Virat was born in the month of 30 days after July. Shikhar was born after Virat and before MS dhoni. There were as many persons born before Mukesh as after MS dhoni. one person was born between Ravindra and Mohit. Rohit was born before Ravindra and after Arav.

1. How many persons were born between Mukesh and MS dhoni?
(a) Seven (b) Three
(c) Six (d) Four
(e) More than four

2. Who among the following was born in march?
(a) Mukesh (b) Virat
(c) Rahul (d) Arav
(e) None of these

3. In which of the following month virat was born?
(a) March (b) April
(c) June (d) October
(e) None of these

4. If Arav is related to april, Mohit is related to july then, rahul is related to which of the following?
(a) March (b) May
(c) June (d) August
(e) October

5. Four of the following five are alike in certain way and from a group, find the one which does not belong to that group?
(a) Mohit (b) Rohit
(c) Shikhar (d) Ravindra
(e) Rahul

DIRECTIONS (Qs. 6-10): *In each of the questions below are given some statements followed by two conclusions. You have to take the given statements to be true even if they seem to be at variance with commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.*

(a) If only conclusion I follows.
(b) If only conclusion II follows.
(c) If either conclusion I or II follows.
(d) If neither conclusion I nor II follows.
(e) If both conclusions I and II follow.

6. **Statements:** Only a few Room is Road.
All Road is House.
No House is Building.
Conclusion **I :** All Room is Road is a possibility.
II: Some Room is Building.

7. **Statments:**
All Pen is pencil.
Some Book is Pencil.
No Pen is Notebbok.
Conclusion **I :** Some Pen is Book.
II: No Pen is Book.

8. **Statements:**
No Pant is Sweater.
Only a few Sweater is Lower.
All Lower is T-shirt.
Conclusion **I :** All Pant is T-shirt is a possibility.
II: All Sweater is lower is a possibility.

9. **Statements:**
Only a few Pineapple is Honey.
All Honey is Orange.
No Orange is Banana.
Conclusion **I :** Some Honey is Banana.
II: No Honey is Banana.

10. **Statements:**
No Cat is dog.
Only a few dog is Cow .
All Cow is goat.
Conclusion **I :** Some dog is goat.
II: Some Cow is Cat.

DIRECTION (Qs. 11-15):

Eight persons – Navya, Farukh, Ankur, Mangal, Ravan, Danav, Simar, and Gopal are seated around a circular table such that only three of them are facing away from the centre and the rest are facing towards the centre (not necessarily in the same order). Navya sits second to the left of Ankur. Farukh is not an immediate neighbour of both Ankur and Navya. One of the immediate neighbours of Ankur faces opposite direction of Ankur. Gopal sits third to the left of Navya. Danav sits second to the left of Gopal. Mangal is not an immediate neighbour of Farukh. Simar sits third to the left of Mangal. Ravan and Farukh face the same direction as Mangal faces. Farukh doesn't sit opposite to both Ankur and Navya.

11. Who among the following sits second to the right of Danav?
(a) Navya (b) Simar
(c) Mangal (d) Gopal
(e) Simar

12. Who among the sits in front of Ravan?
(a) Farukh (b) Mangal
(c) Navya (d) Ankur
(e) None of these

13. If the all persons are made to according to their names appear in dictionary in clockwise direction starting from Ankur then position of how many person(s) will remain unchanged including Ankur?
(a) One (b) Two
(c) Three (d) Four
(e) Five

14. Who among the following sits third to the left of Simar?
(a) Mangal (b) Danav
(c) Navya (d) Ravan
(e) None of these

15. How many person(s) sit between Ravan and Navya when counted from the right of Navya?
(a) One (b) Two
(c) Three (d) Four
(e) Five

DIRECTIONS (Qs. 16-17): *Study the following information carefully and answer the questions given below:*

Eight members are living in a family. B is the only son of A. E is wife of F. E is sister of B and C. G is daughter in law of H. D is son of E. H is the mother of B.

16. How is D related to C?
(a) Son (b) Daughter
(c) Nephew (d) Niece
(e) Can't be determined

17. How many female members are in the family?
(a) Four (b) Five
(c) Three (d) Six
(e) None of these

18. How many such numerals are there in the number '926431758' which will remain at the Same position when arranged in ascending order from left to right?
(a) One (b) Two
(c) Three (d) Four
(e) None of these

19. How many pairs of letters are there in the word 'EDUCATION', each of which have as many letters between then in the word as they have between them in the English alphabet?
(a) Five (b) Two
(c) Three (d) Four
(e) None of these

20. If four letter word is formed from 1st, 3rd, 5th and 6th letter of TRANSLATE then what is the 3rd letter of newly formed word? If more than one meaningful word is formed, then the answer will be Z.
(a) L (b) T
(c) A (d) S
(e) Z

DIRECTIONS (Qs. 1-25): *Read the following information carefully and answer the questions given below:*

Twelve people are sitting in two parallel rows containing six people each in such a way that there is an equal distance between adjacent persons. In row 1 – M, N, O, P, Q and R are seated (but not necessarily in the same order) and all of them are facing south. In row 2 – U, V, W, X, Y and Z are seated (but not necessarily in the same order) and all of them are facing North. Therefore, in the given seating arrangement each member seated in a row faces another member of the other row. M faces X. R does not face U, who sits left to Y but not immediate left. O sit at one of the ends and diagonally opposite to V. Three persons sit between V and Z, who does not face R. W sits immediate left to X but does not faces P. Two persons sit between N and R, none of them sits at the end. The one who faces Q sits 2nd right to U.

21. Who among the following faces U?
(a) P (b) Q
(c) N (d) O
(e) none of these

22. How many persons sit to the right of O?
(a) No One (b) One
(c) Two (d) Three
(e) Four

23. Four of the following five form a group, who among the following does not belongs to that group?
(a) R (b) Q
(c) Y (d) W
(e) U

24. If in a certain way O is related to W, Q is related to Y, then who among the following is related to X?
(a) U (b) T
(c) E (d) N
(e) Q

25. Who among the following sit 3rd right to R?
(a) O (b) Q
(c) M (d) P
(e) N

DIRECTIONS (Qs. 26-30): *Study the following information carefully and answer the questions given below:*

In a certain code language
'left right centre' is written as 'yo vo na',
'ahead below behind' is written as 'sa ra la',
'above centre right' is written as 'ha vo na', and
'behind below above' is written as 'ha ra la'.

26. What is the code for 'above'?
(a) sa (b) ha
(c) yo (d) na
(e) None of these

27. 'behind' will be written as?
(a) ra (b) ha
(c) la (d) Either (a) or (c)
(e) None of these

28. What is the code for 'below'?
(a) ra (b) yo
(c) la (d) ha
(e) Can't be determined

29. What does 'sa' stand for?
(a) behind (b) below
(c) ahead (d) above
(e) None of these

30. What is the code for 'centre'?
(a) va (b) na
(c) sa (d) ha
(e) Either (a) or (b)

DIRECTIONS (Qs. 31-35): *Study the following information and answer the questions given below:*

There are eleven boxes placed one above the other. Five boxes are placed between B_4 and B_{11}. Not more than five boxes are kept above B_{11}. Two boxes are kept between B_{11} and B_8. Three boxes are kept between B_8 and B_{10} and B_8 is kept at one of the positions above B_{10}. There are only three boxes kept above the box B_6. One box is kept between B_9 and B_{10}.Two boxes are kept between B_9 and B_5. Box B_2 is kept at one of the positions below box B_7 and at one of the positions above box B_1 which is not above B_9. Box B_3 is kept immediately above B_7.

31. How many boxes are placed between B_6 and B_{10}?
(a) 5 (b) 6
(c) 3 (d) 4
(e) None of these

32. Which of the following statement is true regarding B_1?
(a) B_1 is placed at one of the positions above B_2
(b) B_1 is placed immediately below B_4.
(c) B9 is placed just above B_1
(d) B_1 is placed at the bottom most position
(e) None of these

33. Which of the following is not true regarding B_6?
(a) B_6 is immediately below box B_{11}
(b) One of the boxes below B_6 is B_2
(c) Number of boxes between B_6 and B_{10} is four
(d) One of the boxes above $B_6$is B_7
(e) One box is kept between B_6 and B_8

34. Number of boxes above B_5 is one less than the number of boxes below _____?
(a) B_{10} (b) B_9
(c) B_4 (d) B_2
(e) None of these

35. How many boxes are there between B_8 and B_3?
(a) One (b) Two
(c) Three (d) Four
(e) More than three

DIRECTIONS (Qs. 36-40): *In each of the question, relationships between some elements are shown in the statements. These statements are followed by conclusions numbered I and II. Read the statements and give the answer.*

(a) If only conclusion I follows.
(b) If only conclusion II follows.
(c) If either conclusion I or II follows.
(d) If neither conclusion I nor II follows.
(e) If both conclusions I and II follow.

36. **Statements:** $D \le L = F \le R \le M = P \ge T$
Conclusions: **I.** $P = D$
II. $D < P$

37. **Statements:** $X > B = S \ge K < I \le M \le C$
Conclusions: **I.** $K < X$
II. $B > I$

38. **Statements:** $E < O \le K = S > A \ge P \ge T$
Conclusions: **I.** $T < K$
II. $E < A$

39. **Statements:** $G \le B = H \le C = D \ge S > T$
Conclusions: **I.** $S \ge B$
II. $G > T$

40. **Statements:** $J \ge O = T \ge E > K \ge G > P$
Conclusions: **I.** $G < O$
II. $J \ge K$

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 41-46): *Study the table given below and answer the following questions.*

Company	Total employee	Employee in HR dept.	% of Female in HR dept.
A	400	100	70
B	450	70	60
C	500	120	50
D	300	80	80

41. Find the average no. of females in HR department together?
(a) 60 (b) 49
(c) 59 (d) 58
(e) 62

42. Females in the HR dept. of company C is what % more than male in HR department of company A?
(a) 250% (b) 200%
(c) 100% (d) 300%
(e) 150%

43. If total no. of employee in E is 25% more than D and no. of employee in HR dept. is same as in company C, then employee other than HR dept. in company E is what % of other dept. employee in company B.
(a) 50% (b) 80%
(c) 67% (d) 57%
(e) 60%

44. Find the difference between males of HR dept. in company C and D together and females of HR dept. in company B and C together?
(a) 26 (b) 30
(c) 32 (d) 36
(e) 16

45. Find the average no. of employee other than HR dept. in A, B and C together ?
(a) 320 (b) 360
(c) 453 (d) 350
(e) 353

46. If there are total 150 females in company C then how many female employees are there other than females of HR department?
(a) 90 (b) 100
(c) 80 (d) 110
(e) 120

DIRECTIONS (Qs. 47-51) : *Find the missing term in the following number series :*

47. 1964, 1621, ?, 1280, 1216, 1189
(a) 1425 (b) 1415
(c) 1410 (d) 1405
(e) 1420

48. 16, ?, 8, 16, 64, 512
(a) 12 (b) 8
(c) 18 (d) 10
(e) 6

49. 14, 7.5, 8.5, 14.25, 30.5, ?
(a) 78.75 (b) 68.75
(c) 63.75 (d) 71.25
(e) None of these

50. 10, 25, 80, ?, 1630, 9785
(a) 330 (b) 325
(c) 425 (d) 400
(e) 370

51. 132, 156, 188, ?, 276, 332
(a) 216 (b) 220
(c) 240 (d) 228
(e) 230

52. If a boat travels 24 km more in downstream than in upstream in 3 hr. and if the speed of the Boat in still water is 25 km/hr. find the distance travelled by boat in downstream in 5 hr.
(a) 150 km (b) 145 km
(c) 140 km (d) 175 km
(e) 160 km

53. Gita invested ₹ 18000 at some rate of interest of S.I. and Rupali joined him after 3 months investing ₹ 24000 at same rate of interest Gita leaves before 2 months of completion, then what will be the share of Rupali's profit after 1 year if total profit is ₹ 20000?
(a) 10000 (b) 14000
(c) 12000 (d) 10909
(e) 11000

54. If ratio of ages of Rahul and Pintu before 6 years ago is 6:4 and after 10 years sum of their ages will be 72 years, then what was Rahul age 4 years ago ?
(a) 30 years (b) 28 years
(c) 27 years (d) 32 years
(e) 26 years

55. If pipes A and B can fill a tank in 18 min and 24 mins respectively and pipe C empties the tank in 12 mins. What will be the time taken by A, B and C together to fill the tank completely ?
(a) 36 (b) 72
(c) 54 (c) 96
(e) 12

DIRECTIONS (Qs. 56-60) : *Solve the given quadratic equations and mark the correct option based on your answer :*

(a) $x > y$ (b) $x < y$
(c) $x \geq y$ (d) $x \leq y$
(e) $x = y$ or there is no relationship

56. (i) $x^2 = 121$
(ii) $y^2 - 22y + 121 = 0$

57. (i) $x^2 - 6x + 8 = 0$
(ii) $2y^2 - 16y + 30 = 0$

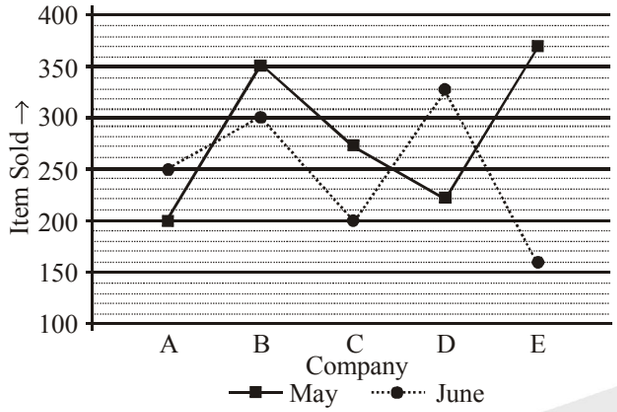
58. (i) $x^2 - 21x + 108 = 0$
(ii) $y^2 - 11y + 18 = 0$

59. (i) $x^2 - 9x + 20 = 0$
(ii) $y^2 - 16y + 63 = 0$

60. (i) $x^3 = 729$
(ii) $y^2 = 81$

61. If a shopkeeper marks an item 60% above its CP and if 20% discount is given on the marked price and the shopkeeper makes profit of ₹ 210, then what will be the actual cost price of the item ?
(a) ₹ 1000 (b) ₹ 800
(c) ₹ 750 (d) ₹ 1200
(e) ₹ 900

DIRECTIONS (Qs. 62-67): *The line graph shows the data of five seller selling an item (in units) on May and June.*



62. The no. of item sold by A and C together is how much more or less then items sold by B and D together on both months ?
(a) 250 (b) 280
(c) 300 (d) 320
(e) 350

63. What is the average no. of items sold by all five sellers on June ?
(a) 248 (b) 250
(c) 240 (d) 230
(e) 246

64. Items sold by B and C on May together is what % more than same sellers on June together?
(a) 25% (b) 30%
(c) 20% (d) 15%
(e) 24%

65. Find the difference between items sold by B, D, E on June together and items sold by B and E on May together.
(a) 72 (b) 65
(c) 80 (d) 70
(e) 90

66. Item sold on June by C and E together is approximately what percentage of total items sold by A and B together on May ?
(a) 65.45% (b) 65.32%
(c) 61.48% (d) 72.3%
(e) 66%

67. Find the difference between the average items sold by A and B together on June and average of items sold by B and C together on May.
(a) 45 (b) 35
(c) 25 (d) 40
(e) 50

68. If Raman start from A towards B with speed 50 km/h at 12:00 am and Sohan starts with speed 60 km/h at 12:30 am from B towards A and total distance between A and B is 600 km, find at what time they will cross each other?
(a) 6:43 (b) 5:43
(c) 5:00 (d) 4:37
(e) 6:54

69. If Saroj invested 6000 at x% S.I. for 3 years and same amount at $(x + 5)$% CI for 2 years and difference between both interest is ₹ 60, then find x ? (in %)
(a) 15 (b) 18
(c) 20 (d) 24
(e) 25

DIRECTIONS (Qs. 70-74) : *Read the information carefully and answer the questions.*

There are 3600 students in two collage 'A' and 'B' and three streams in each collage i.e. art, science and commerce. $18\frac{3}{4}$% of total students in collage A are in commerce stream and $28\frac{4}{7}$% of total students in collage B are in science stream. Sum of total students in commerce stream in A & science stream in B is 840. $19\frac{1}{21}$% of total students in collage B are in commerce stream and 50% of total students in collage A are in art stream.

70. Total students in art stream in A is what percent more than total students in science stream in B ?
(a) 75% (b) 70%
(c) 90% (d) 100%
(e) 110%

71. Find the ration of total students in commerce stream in B to total students in science stream in A?
(a) 8 : 15 (b) 8 : 17
(c) 8 : 13 (d) 8 : 11
(e) 8 : 9

72. If in collage C total students are 1440 students and total students in science stream of collage C are 25% more than total students in commerce stream in collage B, then total students of art & commerce stream in collage C is how much less than total students in art and commerce stream in collage A ?
(a) 220 (b) 240
(c) 300 (d) 200
(e) 280

73. Find the average number of students in science stream in collage A & B ?
(a) 500 (b) 540
(c) 480 (d) 400
(e) 450

74. If out of total students in art stream of collage A & B, ratio of boys to girl is 5 : 3 and 7 : 4 respectively, then find difference between boys and girls in art stream of collage A & B together?
(a) 440 (b) 450
(c) 480 (d) 496
(e) 448

75. Rohit invested 50% more than Mohit and Ranjeet invested 30% more than Mohit. If ratio of investment time-period (Rohit : Mohit : Ranjeet) is 3 : 5 : 4 and the sum of profit shares of Mohit and Ranjeet is ₹ 22950 then find the profit share of Rohit (in ₹).

(a) 10432 (b) 11243
(c) 10000 (d) 10125
(e) 11345

76. When a man sold an article, his profit percent is 50% of the selling price. If the cost price is increased by 60% and the selling price remains the same, then find decrement in the profit percent on the selling price of the article?

(a) 25% (b) 30%
(c) 40% (d) 27.5%
(e) None of these

77. Area of 1st circle and circumference of IInd circle is 2464 cm^2 and 132 cm respectively. There is a square whose side is 25% of twice of sum of the radius of both the circles. Find the perimeter of the square (in cm) ?

(a) 100 (b) 96
(c) 98 (d) 102
(e) 104

78. There are 6 red, 8 black and 6 blue balls in a bag. Out of these balls, 6 balls are picked out at random from the bag. Then, what is the probability that 2 are red, 2 are black and 2 are blue ball ?

(a) $\frac{13}{54}$ (b) $\frac{12}{52}$
(c) $\frac{14}{52}$ (d) $\frac{28}{104}$
(e) $\frac{14}{36}$

79. An article is marked $33\frac{1}{3}\%$ above the cost price and loss incurred on selling that article is 25% of the discount given on it. Then, find the discount % given?

(a) 33% (b) $33\frac{1}{3}\%$
(c) $32\frac{1}{3}\%$ (d) $33\frac{2}{3}\%$
(e) 30%

80. A train is travelling at 36 km/hr. and crosses a platform of 50m in 9 seconds and another train travelling at 54 km/hr crosses the same platform in 12 seconds. Find the length of another train?

(a) 140 (b) 100
(c) 180 (d) 120
(e) 130

HINTS & SOLUTIONS

Sol. (1-5):

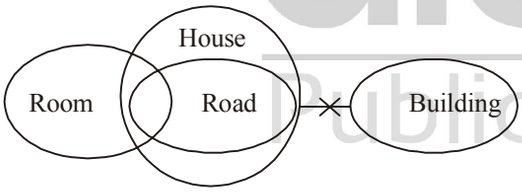
Months	Boys
January	Mukesh
March	Arav
April	Rahul
May	Mohit
July	Rohit
August	Ravindra
September	Virat
October	Shikhar
November	MS dhoni

1. (a) **2. (d)**

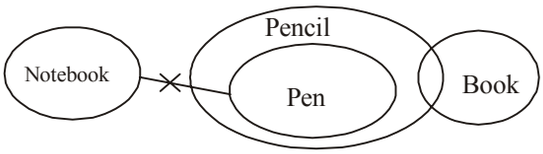
3. (e) **4. (b)**

5. (e) Mohit, Rohit, Shikhar, Ravindra born in a month that has 31 days and Rahul born in a month that has 30 days.

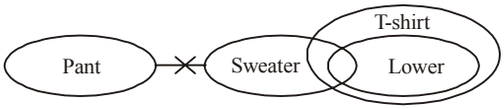
6. (d) neither conclusion I nor II follows.



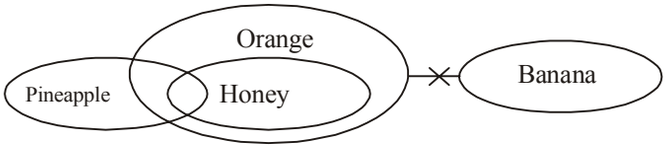
7. (c) either conclusion I or II follows.



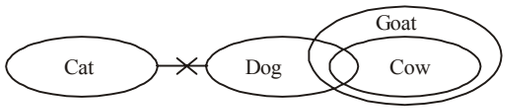
8. (a) only conclusion I follows.



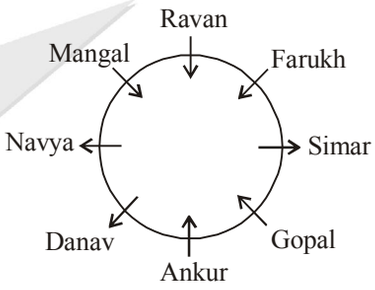
9. (b) only conclusion II follows.



10. (a) only conclusion I follows.



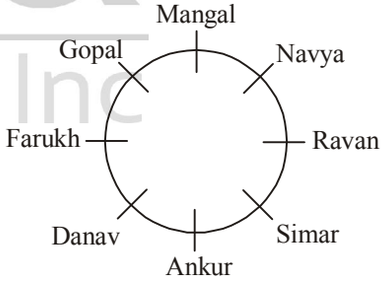
Solutions (11-15):



11. (c) From the solution we can say that Mangal sits second to the right of Danav.

12. (d) From the solution we can say that Ankur sits in front of Ravan.

13. (b) From the solution and applying the given conditions, we get:

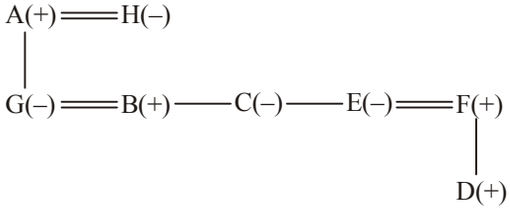


Here, we can see that position of two persons is unchanged including Ankur.

14. (a) From the final solution we can say that Mangal sits third to the left of Simar.

15. (a) From the solution we can say that only one person sit between Ravan and Navya when counted from the right of Navya.

Sol. (16-17):



16. (c) **17.** (a)

18. (c)

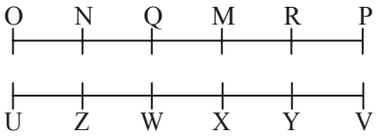
9 2 6 4 3 1 7 5 8
1 2 3 4 5 6 7 8 9

19. (a)

EDUCATION

20. (e) Meaningful words from letter T, A, S and L are SALT and LAST.

Sol. **(21-25):**



21. (d) **22.** (a)

23. (e) **24.** (d)

25. (e)

Sol. **(26-30):**

Word	Code
Right/centre	vo/na
Left	yo
Below/behind	ra/la
Ahead	sa
above	ha

26. (b) **27.** (d)

28. (e) **29.** (c)

30. (e)

Sol. **(31-35):**

$B_3 \rightarrow B_7 \rightarrow B_{11} \rightarrow B_6 \rightarrow B_5 \rightarrow B_8 \rightarrow B_2 \rightarrow B_9 \rightarrow B_4 \rightarrow B_{10} \rightarrow B_1$

31. (a) **32.** (d)

33. (c) **34.** (e)

35. (d)

36. (c) $D \le L = F \le R \le M = P \ge T$

Conclusion: **I:** $D \le L = F \le R \le M = P$

$P = D$ (False)

II. $D < P$ (False)

But it is a complimentary pair so, either conclusion I or II follows.

37. (a) $X > B = S \ge K < I \le M \le C$

Conclusion: I. $X > B = S \ge K$

$K < X$ (True)

Conclusion: II. $B = S \ge K < I$

$B > I$ (False)

So, only conclusion I follows.

38. (a) $E < O \le K = S > A \ge P \ge T$

Conclusion: I. $K = S > A \ge P \ge T$

$T < K$ (True)

Conclusion: II. $E < O \le K = S > A$

$E < A$ (False)

So, only conclusion I follows.

39. (d) $G \le B = H \le C = D \ge S > T$

Conclusion: I. $B = H \le C = D \ge S$

$S \ge B$ (False)

Conclusion: II. $G \le B = H \le C = D \ge S > T$

$G > T$ (False)

So, neither conclusion I nor II follows.

40. (a) $J \ge O = T \ge E > K \ge G > P$

Conclusion: I. $O = T \ge E > K \ge G$

$G < O$ (True)

Conclusion: II. $J \ge O = T \ge E > K$

$J \ge K$ (False)

So, only conclusion I follows.

41. (c) Average no. of females in HR dept.

$$= \frac{100 \times \frac{70}{100} + 70 \times \frac{60}{100} + 120 \times \frac{50}{100} + 80 \times \frac{80}{100}}{4}$$

$$= \frac{70 + 42 + 60 + 64}{4} = 59$$

42. (c) Females in company C (HR) $= \cancel{120} \times \frac{\cancel{50}}{\cancel{100}} = 60$

Males in company A (HR) $= \cancel{100} \times \frac{\cancel{30}}{\cancel{100}} = 30$

Difference $= 60 - 30 = 30$

$\frac{30}{30} \times 100 = 100\%$

43. (c) Total employee in E $= 300 \times \frac{125}{100} = 375$

$\therefore$ employee of HR dept. in E = 120

$\therefore$ other employee = 255

$\therefore$ % of other employee $= 255 \times \frac{100}{380} = 67\%$

44. (a) Males in HR dept. in C and D

$= 120 \times \frac{50}{100} + 80 \times \frac{20}{100} = 76$

Females in HR dept. of B and C

$= 70 \times \frac{60}{100} + 120 \times \frac{50}{100} = 102$

$\therefore$ Difference $= 102 - 76 = 26$

45. (e) Average of A, B, C

$= \frac{300 + 380 + 380}{3} = 353.33 \approx 353$

46. (a) Total females in company C = 150

Females in HR department in company C

$= 120 \times \frac{50}{100} = 60$

Therefore, females other than in HR department

$= 150 - 60 = 90$

47. (d) 1964 1621 1405 1280 1216 1189

-343 -216 -125 -64 -27

$= -7^3$ $= -6^3$ $= -5^3$ $= -4^3$ $= -3^3$

48. (b) 16, ?, 8, 16, 64, 512

$16 \times .5 = \boxed{8}$

$8 \times 1 = 8$

$8 \times 2 = 16$

$16 \times 4 = 64$

$64 \times 8 = 512$

49. (a) $14 \times .5 + .5 = 7.5$

$7.5 \times 1 + 1 = 8.5$

$8.5 \times 1.5 + 1.5 = 14.25$

$14.25 \times 2 + 2 = 30.5$

$30.5 \times 2.5 + 2.5 = 78.75$

50. (b) $10 \times 2 + 5 = 25$

$25 \times 3 + 5 = 80$

$80 \times 4 + 5 = 325$

$325 \times 5 + 5 = 1630$

$1630 \times 6 + 5 = 9785$

51. (d) 132 156 188 228 276 332

+24 +32 +40 +48 +56

52. (b) (Ds – Du) 3 = 24 km

Different in 1 hr. = 8 km

Speed of stream $= \frac{8}{2} = 4$ km/h

$\therefore$ Speed of boat in still water = 25 km/hr.

Ds = 29 km/hr., Du = 21 km/hr.

Distance travelled = 29 × 5 = 145 km

53. (d) Gita Rupali

18000×10 24000×9 :

10 : 12

5 : 6

$\therefore$ Rupali's share $= 20000 \times \frac{6}{11} = ₹\ 10909$

54. (e) Rahul Pintu

-6 6 4

+10 Rahul + Pintu = 72

Age increased in 16 years = 32 years

Sum of age of Rahul and Pintu after 10 years = 40

$\therefore 6x + 4x = 40$

$x = 4$

Rahul age 4 years ago $= 6x + 2 = 26$ years

55. (b) A B C

18 24 12

+4 +3 –6

72

$\therefore$ tank filled in 1 min = 1 unit

Total time $= \frac{72}{1} = 72$ minutes

56. (d) (i) $x^2 = 11$

$x = \pm 11$

(ii) $y^2 - 22y + 121 = 0$

$(y - 11)^2 = 0$

$y = 11, 11$

$\therefore x \le y$

57. **(e)** (i) $x^2-6x+8=0$

$x^2-4x-2x+8=0$

$x(x-4)-2(x-8)=0$

$x=4,2$

(ii) $2y^2-16y+30=0$

$2y^2-10y-6y+30=0$

$2y(y-5)-6(y-5)=0$

$y=5,3$

$\therefore$ No relation exist.

58. **(c)** (i) $x^2-21x+108=0$

$x^2-9x-12x+108=0$

$x(x-9)-12(x-9)=0$

$x=9,12$

(ii) $y^2-11y+18=0$

$y-9y-2y+18=0$

$y(y-9)-2(y-9)=0$

$y=2,9 \quad \therefore \quad x \geq y$

59. **(b)** (i) $x^2-9x+20=0$

$\Rightarrow x^2-5x-4x+20=0$

$x(x-5)-4(x-5)=0$

$x=4,5$

(ii) $y^2-16y+63=0$

$y^2-9y-7y+63=0$

$y(y-9)-7(y-9)=0$

$y=9,7$

$\therefore x<y$

60. **(c)** (i) $x^3=729$

$x=\sqrt[3]{729}=9$

(ii) $y^2=81$

$y=\sqrt{81}=\pm 9$

$\therefore x \geq y$

61. **(c)** Let CP $=100x$

$\therefore$ marked price $=160x$

$\therefore$ selling price after giving discount $=128x$

$\Rightarrow 28x=210$

$x=7.5$

$\therefore$ CP $=₹750$

62. **(b)** Item sold by A and C $=450+470=920$

Item sold by B and D $=650+550=1200$

$\therefore$ difference $=1200-920=280$

63. (a) Average $=\dfrac{250+300+200+330+160}{5}$

$=\dfrac{1240}{5}=248$

64. (e) Item sold by B and C on June $=300+200=500$

Item sold by B and C on May $=350+270=620$

$\therefore$ % increase $=120\times\dfrac{100}{500}=24\%$

65. (d) Items sold on June by B, D and E

$=300+330+160=790$

Item sold on May by B and E

$=350+370=720$

$\therefore$ diff. $=790-720=70$

66. (a) Item sold by C and E on June $=200+160=360$

Item sold by A and B together on May

$=350+200=550$

$?=360\times\dfrac{100}{550}=65.45\%$

67. (b) Avg. by A and B on June $=\dfrac{550}{2}=275$

Avg. of B and C on May $=\dfrac{620}{2}=310$

Diff. $=310-275=35$

68. (b)

A	600 km.	B
Raman		Sohan
12:00 am		12:30 am
50 km/h		60 km/h

Distance travelled by Raman in $\dfrac{1}{2}$ hr $=25$ km

Remaining distance to be covered

$=600-25=575$ km

Relative speed $=50+60=110$

$\therefore$ time taken $=\dfrac{575}{110}=5.23$

$\therefore$ time $=12:30+5:13=5:43$ am.

69. (a) By going with the options

$$\text{Interest received at SI} = \frac{6000 \times 3 \times 15}{100} = ₹2700$$

$\therefore\ x + 5 = 20\%$

Interest received after 2 years at CI

$$= \frac{6000 \times 44}{100} = 2640$$

$\therefore$ Difference $= 2700 - 2640 = ₹60$

$x = 15\%$

Sol (70–74) :

Let total students in A $= x$

And, total students in B $= y$

Total students in collage A in commerce stream

$$= x \times \frac{75}{4} \times \frac{1}{100} = \frac{3x}{16}$$

Total students in collage B in science stream

$$= y \times \frac{200}{7} \times \frac{1}{100} = \frac{2y}{7}$$

Given, $\frac{3x}{16} + \frac{2y}{7} = 840$ ..... (i)

And $x + y = 3600$ ..... (ii)

So from (i) and (ii),

Total students in collage A $= 1920$

And total students in collage B $= 1680$

Total students in collage B in commerce stream

$$= \frac{400}{21} \times \frac{1}{100} \times 1680 = 320$$

Total students in collage A in art stream

$$= \frac{1}{2} \times 1920 = 960$$

Now, total students in collage A in science stream

$$= 1920 - \frac{3}{16} \times 1920 - 960 = 600$$

And total students in collage B in art stream

$$= 1680 - \frac{2}{7} \times 1680 - 320 = 880$$

Streams	A	B
Art	960	880
Commerce	360	320
Science	600	480

70. (d) Required percentage $= \frac{960 - 480}{480} \times 100$

$= 100\%$

71. (a) Required ratio $= \frac{320}{600} = 8:15$

72. (e) Total student art & commerce stream in C

$$= 1440 - 320 \times \frac{125}{100} = 1040$$

Required difference $= (960 + 360) - 1040 = 280$

73. (b) Required average

$$= \frac{600 + 480}{2} = \frac{1080}{2} = 540$$

74. (c) Total boys in art stream of collage A & B together

$$= 960 \times \frac{5}{8} + 880 \times \frac{7}{11}$$

$= 600 + 560 = 1160$

Total girls in art stream of school A & B together

$$= 960 \times \frac{3}{8} + 880 \times \frac{4}{11}$$

$= 360 + 320 = 680$

Required difference $= 1160 - 680 = 480$

75. (d) Let the investment of Mohit $= 100x$

Investment of Rohit $= 150x$

Investment of Ranjeet $= 130x$

Ratio of profit :

Rohit	Mohit	Ranjeet
$150x \times 3$	$100x \times 5$	$130x \times 4$
45	50	52

102 unit $= 22950$

1 unit $= 225$

45 unit $= 225 \times 45 = ₹10125$

76. (b) Let the selling price be $200x$.

Then, profit $= 100x$

C.P. $= 200x - 100x = 100x$

$$\text{Now, new C.P.} = 100x \times \frac{160}{100} = 160x$$

S.P. $= 200x$

New profit $= 200x - 160x = 40x$

Required % $= \frac{100x - 40x}{200x} = \frac{60}{200} \times 100 = 30\%$

77. (c) Circumference of any circle $= 2\pi \times$ radius

Radius of 1st circle

$= \sqrt{\frac{2464}{\pi}} = \sqrt{784} = 28$ cm

Radius of 2nd circle $= \frac{132}{2\pi} = 21$ cm

Side of square $= \frac{1}{4} \times 2 \times (21 + 28) = 24.5$ cm

Perimeter of square $= 24.5 \times 4 = 98$ cm.

78. (b) Ways to select 6 balls out of 20 balls $= {}^{20}C_6$

Ways to select two red balls $= {}^{6}C_2$

Ways to select two black balls $= {}^{8}C_2$

Ways to select two blue balls $= {}^{6}C_2$

$\therefore$ Required probability $= \frac{{}^{6}C_2 \times {}^{8}C_2 \times {}^{6}C_2}{{}^{20}C_6}$

$= \frac{15 \times 28 \times 15}{20 \times 19 \times 18 \times 17 \times 16 \times 15} / {6 \times 5 \times 4 \times 3 \times 2}$

$= \frac{15 \times 28 \times 15}{4 \times 5 \times 7 \times 13} = \frac{12}{52}$

79. (b) Let the cost price be ₹ $3x$.

Then the marked price = ₹ $4x$

And let the discount given be ₹ $4y$

Then loss incurred = ₹ y

ATQ,

$\Rightarrow 3x - y = 4x - 4y$

$\Rightarrow x = 3y$

Marked price $= 4 \times 3y = 12y$

Required discount % $= \frac{4y}{12y} \times 100 = 33\frac{1}{3}\%$

80. (e) Speed of 1st train $= 36 \times \frac{5}{18} = 10$ m/s

$\therefore$ Distance travelled by 1st train $= 10 \times 9 = 90$ m

$\therefore$ Length of train (1st) $= (90 - 50)$ m $= 40$ m

Speed of 2nd train $= 54 \times \frac{5}{18} = 15$ m/s

$\therefore$ Distance travelled $= 15 \times 12 = 180$ m

$\therefore$ Length of 2nd train $= 180 - 50 = 130$ m