

### Bank Special Math & Reasoning Assignment-I

#### > MATHS

**Directions (Q. 1-5):** In the following number series only one number is wrong. Find out the wrong number.

- 6 12 36 144 722 4320 30240  
(a) 36 (b) 144 (c) 722 (d) 4320  
(e) none of these
- 9261 6859 4913 3375 2197 1321 729  
(a) 1321 (b) 6859 (c) 2197 (d) 4913  
(e) none of these
- 3 5 8 75 1125 84375 94921875  
(a) 94921875 (b) 8 (c) 75  
(d) 1125 (e) none of these
- 4 5 9 20 34 59 95  
(a) 9 (b) 34 (c) 59 (d) 95  
(e) none of these
- 2 13 76 377 1506 4506 9008  
(a) 13 (b) 9008 (c) 4507 (d) 1506  
(e) none of these

**Directions (Q. 6-10):** What should come in place of the question mark (?) in the following questions?

- $\sqrt[3]{175616} = ?$   
(a) 53 (b) 46 (c) 63 (d) 66  
(e) None of these
- $1888 \div 32 \div 8 = ?$   
(a) 472 (b) 7.375 (c) 29.5 (d) 9.485  
(e) none of these
- $4^{2.3} \times 2^{2.3} \times 8^{1.7} = ?$   
(a) 64 (b) 512 (c) 16 (d) 4096  
(e) none of these
- $18.8 \times ? \times 14.2 = 5232.416$   
(a) 20.3 (b) 17.4 (c) 19.6 (d) 16.8  
(e) none of these
- $2\frac{4}{7} + 2\frac{2}{5} + 1\frac{2}{8} = ?$   
(a)  $6\frac{97}{280}$  (b)  $8\frac{47}{140}$  (c)  $8\frac{67}{280}$  (d)  $6\frac{23}{140}$   
(e) none of these

**Directions (Q. 11-15):** What approximate value should come in place of the question mark (?) in the following questions? (Note: You are not expected to calculate the exact value.)

- $\sqrt{1850} = ?$   
(a) 43 (b) 56 (c) 32 (d) 28 (e) 49
- $17.998 \times 23.005 \times 11.99 = ?$   
(a) 3824 (b) 4055 (c) 5138 (d) 5446  
(e) 4964

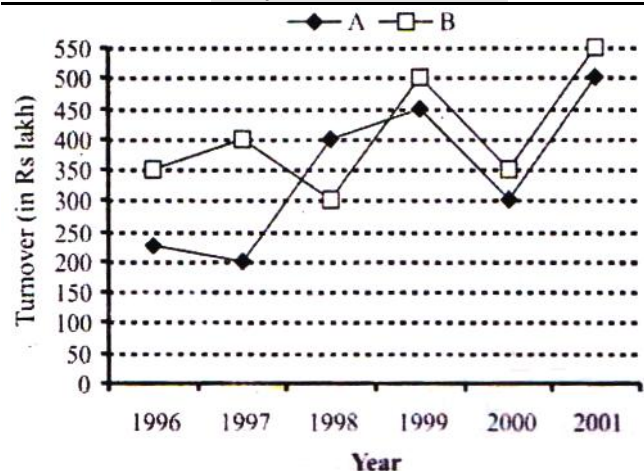
- $9876.5 \div 18.5 \div 3.2 = ?$   
(a) 128 (b) 194 (c) 152 (d) 167 (e) 179
- $(18.6)^3 = ?$   
(a) 7245 (b) 5225 (c) 6435 (d) 7705  
(e) 8045
- $\frac{2225}{7} \times \frac{867}{5} \times \frac{119}{4} = ?$   
(a) 1511345 (b) 1639714  
(c) 1851216 (d) 1420165  
(e) 1583628

**Directions (Q. 16-20):** In the following questions two equations numbered I and II are given. You have to solve both equations and give answer.

- (a) If  $x > y$  (b) If  $x \geq y$  (c) If  $x < y$  (d) If  $x \leq y$   
(e) If  $x = y$  or the relationship cannot be established
- I.  $x^2 + 9x + 20 = 0$  II.  $y^2 + 13y + 41 = 0$
- I.  $x^2 + 11x + 24 = 0$  II.  $y^2 + 12y + 35 = 0$
- I.  $2x + 3y = 14$  II.  $4x + 2y = 16$
- I.  $x^2 + 7x + 12 = 0$  II.  $y^2 + 10y + 24 = 0$
- I.  $x^2 + 28 = 11x$  II.  $y^2 - 15y + 56 = 0$

**Directions (Q. 21-25):** Study the following graph carefully to answer these questions.

**Annual turnover of Companies A and B both during the years (in Rs lakh)**



- What is the per cent increase in the turnover of Company A from the year 2000 to 2001?

- (a)  $33\frac{2}{3}$  (b)  $66\frac{1}{3}$  (c)  $66\frac{2}{3}$  (d)  $36\frac{2}{3}$   
 (e) none of these
22. What is the per cent increase in the total turnover of both the companies taken together from the year 1997 to 1998?  
 (a)  $16\frac{2}{3}$  (b)  $14\frac{2}{7}$  (c)  $16\frac{1}{3}$  (d)  $14\frac{1}{7}$   
 (e) none of these
23. What is the difference between the average turnovers of companies A and B?  
 (a) 48 (b)  $58\frac{1}{3}$  (c)  $35\frac{2}{3}$  (d) 35  
 (e) none of these
24. The turnover of company A in 1998 is approximately what per cent of its total turnover in all the years?  
 (a) 22 (b) 16 (c) 23 (d) 15 (e) 20
25. What is the ratio of the turnover of both companies together in the year 1996 to that in 1997?  
 (a) 2 : 1 (b) 2 : 3 (c) 1 : 1 (d) 3 : 2  
 (e) None of these
26. What will be the area (in square metres) of 1.5 metre wide garden developed around all the four sides of a rectangular field having area equal to 300 square metres and breadth equal to three-fourth of the length?  
 (a) 96 (b) 105 (c) 114  
 (d) Cannot be determined (e) None of these
27. In a two-digit positive number, the digit in the unit's place is equal to the square of the digit in ten's place, and the difference between the number and the number obtained by interchanging the digits is 54. What is 40% of the original number?  
 (a) 15.6 (b) 39 (c) 37.2 (d) 24  
 (e) none of these
28. Vishwas borrowed a total amount of Rs 30,000, part of it on simple interest rate of 12 p.c.p.a. and remaining on simple interest rate of 10 p.c.p.a. If at the end of 2 years he paid in all Rs 36,480 to settle the loan amount, what was the amount borrowed at 12 p.c.p.a.?  
 (a) Rs. 16,000 (b) Rs. 18,000  
 (c) Rs. 17,500 (d) Rs. 12,000  
 (e) None of these
29. If the numerator of a fraction is increased by  $\frac{1}{4}$  and the denominator is decreased by  $\frac{1}{3}$ , the new fraction obtained is  $\frac{33}{64}$ . What was the original fraction?  
 (a)  $\frac{9}{11}$  (b)  $\frac{5}{7}$  (c)  $\frac{3}{7}$  (d)  $\frac{7}{9}$   
 (e) none of these
30. Twice the square of a number is more than eleven times the number by 21. The number can have which of the following values?  
 (a) 4 or  $-\frac{7}{2}$  (b) 7 or  $-\frac{3}{2}$  (c) 3 or  $-\frac{7}{2}$  (d)  $\frac{9}{2}$  or -4  
 (e) None of these
31. A train travelling at the speed of 60 km/hour crosses a platform in 20 seconds. What is the length of the train?  
 (a) 333 metres (b) 300 metres  
 (c) 336 metres (d) Cannot be determined  
 (e) None of these
32. A sum of money is to be divided among four persons in the ratio 2 : 3 : 4 : 5. Out of the four one person gets Rs 200 more than the other and Rs 100 less than another. What is the sum?  
 (a) Rs. 2,800 (b) Rs. 1,400  
 (c) Rs 4,200 (d) Cannot be determined  
 (e) None of these

**Directions (Q. 33-35):** Study the information carefully to answer the questions that follow:

A bucket contains 8 Red, 3 Blue and 5 Green marbles.

33. If 4 marbles are drawn at random, what is the probability that 2 are red and 2 are Blue?  
 (a)  $\frac{11}{16}$  (b)  $\frac{3}{16}$  (c)  $\frac{11}{72}$  (d)  $\frac{3}{65}$   
 (e) none of these
34. If 2 marbles are drawn at random, what is the probability that both are Green?  
 (a)  $\frac{1}{8}$  (b)  $\frac{5}{16}$  (c)  $\frac{2}{7}$  (d)  $\frac{3}{8}$   
 (e) none of these
35. If 3 marbles are drawn at random, what is the probability that none is Red?  
 (a)  $\frac{3}{8}$  (b)  $\frac{1}{16}$  (c)  $\frac{1}{10}$  (d)  $\frac{3}{16}$   
 (e) none of these

## > REASONING

**Directions (Q. 36-41):** Study the following information carefully and answer the given questions.

L, N, P, R, M, Q, T and Y are the members of a committee sitting around a circular table but not facing the centre. Each member has a different zodiac sign, viz Leo, Virgo, Libra, Cancer, Aries, Gemini, Pisces and Scorpio, but not necessarily in the same order.

T is third to the right of P. The one whose sunsign is Leo is second to the left of the one whose sunsign is Libra. Y's sunsign is Libra and is sitting exactly between P and L. The one whose sunsign is Pisces sits second to the right of N. The one whose sunsign is Aries is second to the right of the person whose sunsign is Gemini. P sits third to the left of the person whose sunsign is Virgo. Neither Q nor L is the

immediate neighbour of N. Q is fourth to the left of L. N's sunsign is neither Cancer nor Aries. The person whose sunsign is Leo is sitting second to the right of the person whose sunsign is Cancer.- R's sunsign is Leo and is not an immediate neighbour of N.

**36. Which of the following is N's sunsign?**

- (a) Pisces (b) Scorpio (c) Gemini  
(d) Can't be determined (e) None of these

**37. Who sits third to the right of L?**

- (a) P (b) Y (c) R (d) Q  
(e) None of these

**38. What is Y's position with respect to Q?**

- (a) Third to the left (b) Fourth to the left  
(c) Second to the right (d) Third to the right  
(e) Second to the left

**39. How many persons are there between P and N?**

- (a) None (b) Two (c) Three (d) Four  
(e) None of these

**40. What is the sunsign of P?**

- (a) Gemini (b) Libra (c) Leo  
(d) Can't be determined (e) None of these

**41. Which of the following combinations is true?**

- (a) M-Gemini (b) P-Cancer  
(c) N-Scorpio (d) None is true  
(e) All are true

**Directions (Q. 42-45): Each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and give answer**

- (a) if the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.  
(b) if the data in statement II alone are sufficient to answer the question, while the data in statement I alone, not sufficient to answer the question.  
(c) if the data either in statement I alone or in statement II alone are sufficient to answer the question.  
(d) if the data in both the statements I and II together are not sufficient to answer the question.  
(e) if the data in both the statements I and II together are necessary to answer the question.

**42. Three apples  $A_1$ ,  $A_2$ , and  $A_3$  are shared by five persons D, E, F, G and H. D shares apple  $A_3$  with H. Apple  $A_2$  is shared with F, who shares it with G but not with E. Who among them definitely ate a single apple?**

- I. G did not get share in apple  $A_3$  while E did not get share in apple  $A_2$ .  
II. H likes to share apple  $A_3$ , but not with E.

**43. What is the relation between Q and A?**

- I. P is son of R, who is mother of A's father's sister and grandmother of Q.  
II. N is brother-in-law of P and he has two children. P is a bachelor.

**44. Among Z, K, N, R and M, is M greater than N?**

- I. K is either greater than or equal to N, who is either smaller than or equal to Z. Z is greater than R, who is equal to M.  
II. Z is greater than N and either smaller than or equal to K, who is equal to R and M is greater than R.

**45. L, M, N, O, P, Q, R and S are standing in a straight line facing north. Who sits at the ends of the row?**

- I. S is fourth to the right of O, who is the immediate neighbour of N. L is second to the left of N, who is third to the left of Q.  
II. L is fourth to the left of O and is at one end of the row. N is fourth to the right of S, who is not a neighbour of O.

**Directions (Q. 46-50): Study the following information carefully and answer the questions given below:**

There are eight employees S, T, U, V, W, X, Y and Z of an organisation working in three departments viz P, Q and R. Each of them has a different choice of colours, viz Blue, Yellow, Orange, White, Green, Violet, Brown and Black, but not necessarily in the same order. There are not more than three employees in any department.

V likes Brown colour and does not work in department R. Z does not work in department Q and does not like either Yellow or White colour. W works in department Q and likes neither Blue nor Yellow colour. Y works in department P with only U, who likes Black colour. S and X do not work in the same department as W. The one who likes Blue colour works in department Q. The one who likes Orange colour works in department P. Those who work in department Q like neither White nor Green colour. X does not like Yellow colour.

**46. Which of the following colours does Z like?**

- (a) Orange (b) Green (c) Brown (d) Blue  
(e) None of these

**47. Which of the following groups of employees works in department Q?**

- (a) TVW (b) UVW (c) VWZ (d) TVS  
(e) None of these

**48. Who among the following likes Violet colour?**

- (a) T (b) S (c) W (d) V  
(e) Can't be determined

**49. In which of the following departments does S work?**

- (a) P (b) Q (c) R  
(d) Can't be determined (e) None of these

**50. Which of the following combinations is true?**

- (a) V-P- Black (b) V-Q-Brown  
(c) T-R-Green (d) All are true  
(e) None of these

**51. Player X, one of the best tennis doubles players of all time and certainly India's best alongside Player Y, has been dropped for the tie against Chinese Taipei.**

**Which of the following may be a probable cause for taking the above step?**

- (a) He has fallen victim to a battle with the establishment.
- (b) Player Y is not available for selection.
- (c) There is lack of transparency and accountability in selection.
- (d) The form of Player Y has of late been on the wane.
- (e) None of these

**52. The rupee has been under considerable stress. Which of the following can be a possible effect of the above cause'?**

- (a) The rupee has been depreciated.
- (b) The RBI has decided to release cash into the market.
- (c) The RBI has clamped down on rupee forward contract transactions.
- (d) There will be lesser shocks from the overseas market
- (e) None of these

**53. Prime Minister Manmohan Singh may slash the Cabinet Committee on Investment's (CCI) threshold limit by half to ₹500 crore to get more stalled projects moving again as the government's term nears its end. Which of the following is not in line with the Prime Minister's statement'?**

- (a) A committee was set up in January 2013 to revive projects that have got stuck due to various reasons.
- (b) Industrial growth slumped to a negative 0.2% in the first eight months of 2013-14.
- (c) The PM is committed to reviving India's growth impulses till his last day in office.
- (d) As of now, CCI's mandate allows it to push for time-bound clearances to investments of Rs. 1,000 crore or more.
- (e) None of these

**54. Beverage and snacks maker PepsiCo India is pushing to become more aggressive in the market as it battles Coca-Cola in soft drinks and ITC and Parle in foods. Which of the following can be a part of possible fallout of the above situation"?**

- (a) The company is baiting growth slowing across foods and beverages, fluctuating weather conditions that make market behaviour unpredictable and consumers turning to healthier foods and drinks.
- (b) The foods business is getting increasingly fragmented.
- (c) The company has made sweeping changes in its senior leadership structure.
- (d) Its top eight brands generate a business of about ₹1,000 crore each.
- (e) None of these

**55. In its mid-quarter policy review on 18 December, RBI kept its policy rate unchanged**

**at 7.75%, hoping for a drop in the inflation rate because of an expected fall in food prices.**

**Which of the following statements substantiates the views expressed in the above statement?**

- (a) The Consumer Price Index (CPI)-based inflation has come down just because of the softening of vegetable prices while prices of many other components of food inflation are still hardening.
- (b) Factory output contracted for a second straight month in November, by 2.1%, because of a sharp decline in production of consumer durables.
- (c) Since he took charge in September, RBI governor Raghuram Rajan has raised the key policy rate twice, from 1.25% to 7.75%.
- (d) State governments have done away with middlemen in the sale of fruits and vegetables by amending the Agricultural Produce Market Committee Act.
- (e) None of these

**Directions (Q. 56-60): In the following questions, the symbols \$, @, £, • and # are used with the following meanings as illustrated below:**

'A \$ B' means A is neither greater nor smaller than B

'A @ B' means A is neither greater than nor equal to B

'A £ B' means A is neither smaller than nor equal to B

'A • B' means A is not smaller than B

'A # B' means A is not greater than B

In each of the following questions, assuming the given statements to be true, find out which of the two conclusions I and II given below them is/are definitely true. Give answer

- (a) if only conclusion I is true.
- (b) if only conclusion II is true.
- (c) if either conclusion I or II is true.
- (d) if neither conclusion I nor II is true.
- (e) if both conclusions I and II are true.

**56. Statements : W • P, P £ G, G @ I, I # N**

Conclusions : I. I £ P  
II. N # W

**57. Statements : U @ D, D \$ E, E £ Y, Y • W**

Conclusions : I. W @ E  
II. D £ W

**58. Statements : Z £ N, N # K, K \$ M, M @ R**

Conclusions : I. M \$ N  
II. M £ N

**59. Statements : V • D, D £ T, K \$ T, K # F**

Conclusions : I. D £ K  
II. T • F

**60. Statements : S \$ Q, Q @ B, B • K, K # W**

Conclusions : I. K # S  
II. S @ W

**Directions (Q. 61-65): In each of the questions below are given four statements followed by three conclusions numbered I, II & III. 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.

- 61. Statements : All grapes are plums.**  
 All plums are oranges.  
 Some oranges are apples.  
 Some apples are guavas.  
 Conclusions : I. Some oranges are grapes.  
 II. Some guavas are oranges.  
 III. Some apples are plums.  
 (a) Only I follows (b) Only I & II follow  
 (c) Only I & III follow (d) All I, II & III follow  
 (e) None of these
- 62. Statements : Some pets are dogs.**  
 Some dogs are cats.  
 Some dogs are rats.  
 No rat is goat.  
 Conclusions : I. Some cats are rats.  
 II. No cat is rat.  
 III. No goat is dog.  
 (a) None follows (b) Only I follows  
 (c) Only II follows (d) Only III follows  
 (e) Only either I or II follows
- 63. Statements : Some roses are jasmines.**  
 Some jasmines are lilies.  
 All lilies are marigolds.  
 All marigolds are sunflowers.  
 Conclusions : I. All lilies are sunflowers.  
 II. Some jasmines are marigolds.  
 III. Some jasmines are sunflowers.  
 (a) All follow (b) Only I follows  
 (c) Only II & III follow (d) Only I & II follow  
 (e) None of these
- 64. Statements : Some flats are houses.**  
 Some houses are bungalows.  
 No bungalow is hotel.  
 All hotels are restaurants.  
 Conclusions : I. No bungalow is restaurant.  
 II. Some houses are hotels.  
 III. Some restaurants are hotels.  
 (a) Only I follows (b) Only III follows  
 (c) Only II & III follow (d) None follows  
 (e) None of these

- 65. Statements : Some lemons are chillies.**

No chilly is brinjal.  
 All brinjals are sweets.  
 Some sweets are desserts.

- Conclusions : I. No chilly is sweet.  
 II. Some lemons are desserts.  
 III. Some brinjals are desserts.  
 (a) Only I follows (b) Only II follows  
 (c) Only III follows (d) None follows  
 (e) None of these

**Directions (Q. 66-67): These questions are based on the following information:**

'P × Q' means 'P is wife of Q'.  
 'P + Q' means 'P is son of Q'.  
 'P ÷ Q' means 'P is mother of Q'.  
 'P – Q' means 'P is sister of Q'.

- 66. Which of the following expressions represents the relationship 'T is son-in-law of H'?**  
 (a)  $H - L \div T$  (b)  $H \times F + L \div T$   
 (c)  $H \div R \times T$  (d)  $H \div R + T$   
 (e) None of these
- 67. In 'B ÷ H + M' how is M related to B?**  
 (a) wife (b) husband (c) sister  
 (d) cannot be determined (e) none of these

**Direction (Q. 68-70) : These questions are based on the following set of numbers :**

347 418 635 824 259

- 68. If 'I' is added to the middle digit of each number and then positions of the first and second digits are interchanged and then newly formed numbers are arranged in ascending order, which number will be second from the top?**  
 (a) 347 (b) 418 (c) 635 (d) 824 (e) 259
- 69. If the first and the third digits in each number are interchanged, which number will be the smallest?**  
 (a) 347 (b) 418 (c) 635 (d) 824 (e) 259
- 70. If the first digit in each number is reduced by 1 and then its position is interchanged with the position of the second digit, which number will be the largest?**  
 (a) 347 (b) 418 (c) 635 (d) 824 (e) 259

**> ANSWER KEY**

1. (c)	2. (a)	3. (b)	4. (e)	5. (d)	6. (e)	7. (b)	8. (d)	9. (c)	10. (a)
11. (a)	12. (e)	13. (d)	14. (c)	15. (b)	16. (a)	17. (e)	18. (c)	19. (b)	20. (d)
21. (c)	22. (a)	23. (e)	24. (e)	25. (e)	26. (c)	27. (a)	28. (d)	29. (e)	30. (b)
31. (d)	32. (d)	33. (d)	34. (e)	35. (e)	36. (b)	37. (e)	38. (d)	39. (c)	40. (a)
41. (c)	42. (e)	43. (d)	44. (b)	45. (a)	46. (b)	47. (a)	48. (c)	49. (c)	50. (b)
51. (a)	52. (c)	53. (e)	54. (c)	55. (d)	56. (d)	57. (e)	58. (c)	59. (a)	60. (d)
61. (a)	62. (e)	63. (a)	64. (b)	65. (d)	66. (c)	67. (b)	68. (a)	69. (d)	70. (e)

**Hint & Solutions**

1. The given number series is based on the following pattern :

$$\begin{aligned} 6 \times 2 &= 12 \\ 12 \times 3 &= 36 \\ 36 \times 4 &= 144 \\ 144 \times 5 &= 720 \neq 722 \\ 720 \times 6 &= 4320 \end{aligned}$$

Hence, the wrong number is 722.

2. The given number series is based on the following pattern :

$$\begin{aligned} 21 \times 21 \times 21 &= 9261 \\ 19 \times 19 \times 19 &= 6859 \\ 17 \times 17 \times 17 &= 4913 \\ 15 \times 15 \times 15 &= 3375 \\ 13 \times 13 \times 13 &= 2197 \\ 11 \times 11 \times 11 &= 1331 \neq 1321 \end{aligned}$$

Hence, the wrong number is 1321.

3. The given number series is based on the following pattern :

$$\begin{aligned} 3 \times 5 &= 15 \neq 8 \\ 5 \times 15 &= 75 \\ 15 \times 75 &= 1125 \\ 1125 \times 75 &= 84375 \end{aligned}$$

Hence, the wrong number is 8.

4. The given number series is based on the following pattern :

$$\begin{aligned} 4 + 1^2 &= 5 \\ 5 + 2^2 &= 9 \\ 9 + 3^2 &= 18 \neq 20 \\ 18 + 4^2 &= 34 \\ 34 + 5^2 &= 59 \\ 59 + 6^2 &= 95 \end{aligned}$$

Hence, the wrong number is 20.

5. The given number series is based on the following pattern :

$$\begin{aligned} 2 \times 7 - 1 &= 13 \\ 13 \times 6 - 2 &= 76 \\ 76 \times 5 - 3 &= 377 \\ 377 \times 4 - 4 &= 1504 \neq 1506 \\ 1504 \times 3 - 5 &= 4507 \end{aligned}$$

Hence, the wrong number is 1506.

6.  $\sqrt[3]{175616} = \sqrt[3]{56 \times 56 \times 56} = 56$

7.  $? = \frac{1888}{32 \times 8} = 7.375$

8.  $? = 4^{2.3} \times 2^{2.3} \times 8^{1.7} = (2^2)^{2.3} \times (2)^{2.3} \times (2^3)^{1.7}$   
 $= 2^{4.6} \times 2^{2.3} \times 2^{5.1}$   
 $[ \because (a^x)^y = a^{xy} ]$   
 $= (2)^{4.6+2.3+5.1} = 2^{12} = 4096$

9.  $? = \frac{5232.416}{18.8 \times 14.2} = 19.6$

10.  $? = 2 + \frac{4}{7} + 2 + \frac{2}{5} + 1 + \frac{3}{8} = (2 + 2 + 1) + \left( \frac{4}{7} + \frac{2}{5} + \frac{3}{8} \right)$   
 $= 5 + \left( \frac{160 + 112 + 105}{280} \right)$   
 $= 5 + \frac{377}{280}$   
 $= 5 + 1 \frac{97}{280} = 6 \frac{97}{280}$

11.  $\sqrt{1850} = 43.012 \approx 43$

12.  $? = 17.998 \times 23.005 \times 11.99$   
 $\approx 18 \times 23 \times 12 \approx 4968$

$\therefore$  Approximate value = 4964

13.  $? = \frac{9876.5}{18.5 \times 3.2} = 166.8 \approx 167$

14.  $? = 18.6 \times 18.6 \times 18.6 = 6434.856 \approx 6435$

15.  $? = \frac{225}{7} \times \frac{867}{5} \times \frac{119}{4} = 1639713.75 \approx 1639714$

16. I.  $x^2 + 9x + 20 = 0$

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

$$\Rightarrow x(x + 4) + 5(x + 4) = 0$$

$$\Rightarrow (x + 4)(x + 5) = 0$$

$$\therefore x = -4 \text{ or } -5$$

II.  $y^2 + 13y + 42 = 0$

$$\Rightarrow y^2 + 7y + 6y + 42 = 0$$

$$\Rightarrow y(y + 7) + 6(y + 7) = 0$$

$$\Rightarrow (y + 6)(y + 7) = 0$$

$$\therefore y = -6 \text{ or } -7$$

Clearly,  $x > y$

17. I.  $x^2 + 11x + 24 = 0$

$$\Rightarrow x^2 + 3x + 8x + 24 = 0$$

$$\Rightarrow x(x + 3) + 8(x + 3) = 0$$

$$\Rightarrow (x + 8)(x + 3) = 0$$

$$\therefore x = -8 \text{ or } -3$$

$$\text{II. } y^2 + 12y + 35 = 0$$

$$\Rightarrow y^2 + 7y + 5y + 35 = 0$$

$$\Rightarrow y(y+7) + 5(y+7) = 0$$

$$\Rightarrow (y+5)(y+7) = 0$$

$$\therefore y = -5 \text{ or } -7$$

Clearly, relationship cannot be established.

**18. I.  $2x + 3y = 14$**

$$\text{II. } 4x + 2y = 16$$

By equation I  $\times 2$  - II, we have

$$4x + 6y = 28$$

$$4x + 2y = 16$$

$$\begin{array}{r} - \\ - \\ \hline 4y = 12 \end{array}$$

$$\Rightarrow y = \frac{12}{4} = 3$$

From equation speed of the train I,

$$x + 3 \times 3 = 14$$

$$2x = 14 - 9 = 5$$

$$x = \frac{5}{2} = 2.5$$

**19. I.  $x^2 + 7x + 12 = 0$**

$$\Rightarrow x^2 + 3x + 4x + 12 = 0$$

$$\Rightarrow x(x+3) + 4(x+3) = 0$$

$$\Rightarrow (x+4)(x+3) = 0$$

$$\therefore x = -4 \text{ or } -3$$

$$\text{II. } y^2 + 7x + 12 = 0$$

$$\Rightarrow y^2 + 6y + 4y + 24 = 0$$

$$\Rightarrow y(y+6) + 4(y+6) = 0$$

$$\Rightarrow (y+6)(y+4) = 0$$

$$\therefore y = -6 \text{ or } -4$$

Clearly,  $x \geq y$

**20. I.  $x^2 - 11x + 28 = 0$**

$$\Rightarrow x^2 - 7x - 4x + 28 = 0$$

$$\Rightarrow x(x-7) - 4(x-7) = 0$$

$$\Rightarrow (x-4)(x-7) = 0$$

$$\therefore x = 4 \text{ or } 7$$

$$\text{II. } y^2 - 15y + 56 = 0$$

$$\Rightarrow y^2 - 8y - 7y + 56 = 0$$

$$\Rightarrow y(y-8) - 7(y-8) = 0$$

$$\Rightarrow (y-7)(y-8) = 0$$

$$\therefore y = 7 \text{ or } 8$$

Clearly,  $x \leq y$

**21. Turnover of A in 2000 = 300 lakh**

Turnover of A in 2001 = 500 lakh

$$\therefore \text{Required \% increase} = \frac{200}{300} \times 100 = 66\frac{2}{3}$$

**22. Turnover of both companies in 1997**

$$= 200 + 400 = 600 \text{ lakh}$$

Turnover of both companies in 1998

$$= 300 + 400 = 700 \text{ lakh}$$

$$\text{Hence required \% increase} = \frac{100}{600} \times 100 = 16\frac{2}{3}$$

**23. Average turnover of B**

$$= \frac{225 + 200 + 400 + 450 + 300 + 500}{6} = \frac{2075}{6}$$

Average turnover of B

$$= 350 + 400 + 300 + 500 + 350 + 550 = \frac{2450}{6}$$

$$\therefore \text{Difference} = \frac{2450}{6} - \frac{2075}{6}$$

$$= \frac{2450 - 2075}{6} = \frac{375}{6} = 62\frac{1}{2}$$

**24. Turnover of A in 1998 = 400 lakhs**

Total turnover of A = 500 + 300 + 450 + 400 + 200 + 275 = 2075 lakhs

$$\therefore \text{Required \%} = \frac{400}{2075} \times 100 \approx 20$$

**25. Turnover of A in 1996 and 1997**

$$= 225 + 200 = 425 \text{ lakhs}$$

Turnover of B in 1996 and 1997

$$= 350 + 400 = 750 \text{ lakhs}$$

$$\therefore \text{Required ratio} = 425 : 750 = 17 : 30$$

**26. Let the number be  $10x + x^2$**

Now, according to the question,

$$(10x^2 + x) - (10x + x^2) = 54$$

$$\therefore 9x^2 - 9x = 54$$

$$\therefore x^2 - x - 6 = 0$$

$$\therefore (x-3)(x+2) = 0$$

$$\therefore x = 3 \text{ or } -2$$

But  $x = -2$  is not valid

$\therefore$  The original number = 39

$$\therefore 40\% \text{ of the original number} = \frac{39 \times 40}{100} = 15.6$$

**28. Let the amount borrowed by Vishwas at 12 p.c.p.a be Rs.  $x$**

$\therefore$  amount at 10 p.c.p.a. = Rs.  $(30000 - x)$

$$\text{Now, SI at 12\%} = \frac{x \times 12 \times 2}{100} = \text{Rs. } \frac{6x}{25}$$

$$\text{SI at 10\%} = \frac{(30000 - x) \times 10 \times 2}{100} = \frac{(30000 - x)}{5}$$

Again, according to the question,

$$\frac{6x}{25} + \frac{(30000 - x)}{5} + 30000 = 36480$$

$$\text{or, } \frac{6x + 150000 - 5x}{25} = 36480 - 30000 = 6480$$

$$\text{or, } x = 25 \times 6480 - 150000 = 162000 - 150000 = 12000$$

$\therefore$  required answer = Rs. 12000

**29. Let the original fraction be  $\frac{x}{y}$ .**

$$\begin{aligned} \therefore \frac{x + \frac{1}{4}x}{y - \frac{1}{3}y} &= \frac{33}{64} \\ \therefore \frac{4x + x}{4} \times \frac{3}{3y - y} &= \frac{33}{64} \\ \therefore \frac{5x}{2y} &= \frac{33}{64} \times \frac{4}{3} = \frac{11}{16} \\ \therefore \frac{x}{y} &= \frac{11}{16} \times \frac{2}{5} = \frac{11}{40} \end{aligned}$$

**30. Let the number be  $x$** 

Now, according to the question,

$$\therefore 2x^2 - 11x = 21$$

$$\text{or } 2x^2 - 11x - 21 = 0$$

$$\text{or, } 2x^2 - 14x + 3x - 21 = 0$$

$$\text{or, } 2x(x - 7) + 3(x - 7) = 0$$

$$\therefore (x - 7)(2x + 3) = 0$$

$$\therefore x = 7 \quad \text{or} \quad \frac{-3}{2}$$

$$33. \text{ Total number of ways} = {}^{16}C_4 = \frac{16!}{12!4!} = 1820$$

And favourable number of ways

$$= {}^8C_2 \times {}^3C_2 = \frac{8!}{6!2!} \times \frac{3!}{1!1!2!}$$

$$= 84$$

$$\therefore \text{ Required probability} = \frac{84}{1820} = \frac{3}{65}$$

$$34. \text{ Total number ways} = {}^{16}C_2 = \frac{16!}{14!2!} = 120$$

$$\text{And favourable number of ways} = {}^5C_2 = \frac{5!}{3!2!} = 10$$

$$\therefore \text{ Required probability} = \frac{10}{120} = \frac{1}{12}$$

$$35. \text{ Total number ways} = {}^{16}C_3 = \frac{16!}{13!3!} = 560$$

Total number of ways when all marbles are red

$$= {}^8C_3 = \frac{8!}{5!3!} = 56$$

$\therefore$  Probability when all the three are red

$$= \frac{56}{560} = \frac{1}{10}$$

$$\therefore \text{ And probability when none is red} = 1 - \frac{1}{10} = \frac{9}{10}$$

**42. From I and II.**

	$A_1$	$A_2$	$A_3$
D	—	—	✓
E	✓	×	×
F	—	✓	✓
G	—	✓	×
H	—	—	✓

Thus, E ate only a single apple, viz  $A_1$ .

Hence, both statements are sufficient to answer the question.

**45. From I. L \_ NO \_ Q \_ S**

Hence, statement I is sufficient to answer the question.

From II. L S \_ \_ O N \_ \_

L \_ S \_ O \_ N \_

**46-50**

Person	Department	Colour
W	Q	Violet
Y	P	Orange
U	P	Balck
S	R	Yellow
X	R	White
Z	R	Green
V	Q	Brown
T	Q	Blue

51. Such battles are nothing new in the arena of sport and have ruined many a carrer.

52. Forward trading is a known culprit in bringing imbalance in the markets.

53. Choice 1 is in line with the statement because it seems to be a reference to the CCI mentioned in the statement. 2 is a likely outcome of projects getting stalled. 3 is implied by the decision taken even as "the government's term nears its end". 4 is in line on the basis of simple calculation.

54. Change in leadership structure may be a part of the aggressive strategy.

55. Doing away with middlemen reduces costs and is expected to bring inflation down.

(56-60) :

$\$ \rightarrow =, @, \rightarrow <, \Im \rightarrow >, \bullet \rightarrow \geq, \# \rightarrow \leq$

56. Given statements :  $W \geq P$  ... (i)

$P > G$  ... (ii)

$G < I$  ... (iii)

$I \leq N$  ... (iv)

Combining all these statements, we get

$$W \geq P > G < I \leq N$$

Check for I. We can't compare P and I. Hence, conclusion I is not true.

Check for II. We can't compare W and N. Hence, conclusion II is not ture.

57. Given statements :  $V < D$  ... (i)

$D = E$  ... (ii)

$E > Y$  ... (iii)

$Y \geq W$  ... (iv)

Combining all these statements, we get

$$U < D = E > Y \geq W$$



Check for I.  $E > W$  or  $W < E$  is true. hence, conclusion I is true.

Check for II.  $D > W$  is true. Hence, conclusion II is true.

58. Given statements :  $Z > N$  ... (i)

$N \leq K$  ... (ii)

$K = M$  ... (iii)

$M < R$  ... (iv)

Combining all these statement, we get

$$Z > N \leq K = M < R$$

Hence,  $N \leq M$  or  $M \geq N$  is true. For this, conclusion I ( $M = N$ ) and conclusion II ( $M > N$ ) make a complementary pair.

So, either conclusion I or II is true.

59. Given statement :  $V \geq D$  ... (i)

$D > T$  ... (ii)

$K = T$  ... (iii)

$K \leq F$  ... (iv)

Combining all these statements, we get

$$V \geq D > T = K \leq F$$

Thus,  $D > K$ . Hence, conclusion I is true.

Again,  $T \leq F$ . Hence conclusion ( $T \geq F$ ) is not true.

60. Given statements :  $S = Q$  ... (i)

$Q < B$  ... (ii)

$B \geq K$  ... (iii)

$K \leq W$  ... (iv)

combining all these statements, we get

$$S = Q < B \geq K \leq W$$

Thus, we can't compare K and S. or, S and W. Hence, neither conclusion I nor II is true.

61. All grapes are plums + All plums are oranges =  $A + A = A$  = All grapes are oranges → conversion → some oranges are grapes. hence conclusion I follows. But the last two statements are of I-type and do not lead to any results here. hence II and III do not follow.

62. Some dogs are cats → conversion → Some cats are dogs + Some dogs are rats =  $I + I =$  No conclusion. Hence I and II do not follow. However, since they make a complementary I-E pair, either I or II follows. Again, Some dogs are

rats + No rat is goat =  $I + E = O$  = Some dogs are not goats. But III does not follow.

63. All lilies are marigolds + All marigolds are sunflowers =  $A + A =$  All lilies are sunflowers. Hence conclusion I follows. Some jasmines are lilies + All lilies are marigolds =  $I + A = I$  = Some jasmines are marigolds + All marigolds are sunflowers =  $I + A = I$  = Some jasmines are sunflowers. Hence III follows.

64. No bungalow is hotel + All hotels are restaurants =  $E + A = O^*$  = Some restaurants are not bungalows. hence I does not follow. Some houses are bungalows + No bungalow is hotel =  $I + E = O$  = Some houses are not hotels. Hence II does not follow. All hotels are restaurants (A) → conversion → Some restaurants are hotels (I). Hence III follows.

65. No chilly is brinjal + All brinjals are sweets =  $E + A = O^*$  = Some sweets are not chillies. Hence I does not follow. All brinjals are sweets + Some sweets are desserts =  $A + I =$  No conclusion. Hence III and consequently II do not follow.

68. Adding 1 to the middle digits, we get

357 428 645 834 269

Interchanging the first and second digits, we get

537 248 465 384 629

Now, if we arrange these in ascending order, the second from the top will be 537, which has been obtained from 347.

69. Interchanging the first and the third digits, we get

743 814 536 428 952

The smallest number now is 428, which has been obtained from 824.

**Quicker Method :** Look for the least value of the third digits as after interchanging this will become the first digit.

70. Reducing the first digits by 1, we get

247 318 535 724 159

Of these, 519 is the largest, which has been obtained from 259.

**Quicker Method :** Reduction in first digit has no impact on our result. Look for the largest value of the second digit as after interchanging this will become the first digit.