

114

Topic-wise

Quantitative Aptitude & Data Interpretation

Previous Year Question Bank

for IBPS/ SBI/ RRB/ RBI Bank Clerk/
PO Prelim & Main Exams (2010 - 2024)

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Topic-wise Solved Paper for SBI/IBPS/RRB/RBI 2023-24

Simplification

- What value will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $500 \times 18 \div 6 + 3 + 2$ of 5 of 3
 (a) 1516 (b) 1512 (c) 1514 (d) 1510
 (e) 1533
- What value will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $28 \times 7 + 5 \times 4 - 56 \times 2 + 169 \div 13 = ? \div 24$
 (a) 2970 (b) 2897 (c) 2766 (d) 2808
 (e) 2976
- What value will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $20\% \text{ of } 2000 - 25\% \text{ of } 1000 = 2\% \text{ of } 500 + (?)$
 (a) 130 (b) 140 (c) 150 (d) 149
 (e) 160
- What value will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $760 \div 19 + 8 \times 5 + 7 - 2 + ? = 156$
 (a) 56 (b) 60 (c) 34 (d) 71
 (e) 65
- What value will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $25 \times 400 - 20 \times 200 + 100 \div 2 = ? \times 30 \div 3$
 (a) 505 (b) 400 (c) 605 (d) 500
 (e) 305
- What value will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $90 \times 2 + 6 + ? + 18 \div 3 \times 9 = 300$
 (a) 96 (b) 100 (c) 120 (d) 110
 (e) 60
- What will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $1105 - 15 \times [4 \times (140 - 95)] \div 5 + 100 = ?$
 (a) 618 (b) 625 (c) 623 (d) 612
 (e) 665
- What value will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $50\% \text{ of } 180 - 30\% \text{ of } 150 = ? + (500 - 55 \times 4) \div 8$
 (a) 10 (b) 13 (c) 15 (d) -12
 (e) -13
- What will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $(842 + 598 - 111) \div 3 = 693 - 73 + ?$
 (a) -165 (b) -196 (c) -177 (d) -162
 (e) None of these
- What will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $45 \times 18 + 135 \times -49 + 89 \times 43 = ? + \sqrt{169}$
 (a) 10159 (b) 11519 (c) 12259 (d) 11219
 (e) 11239
- What will come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $\sqrt{324} \times 4 - 40 + 7^2 = 5^3 + 65 - ?$
 (a) -125 (b) 109 (c) -117 (d) -115
 (e) 119
- What will come in place of question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $(952 + 348) \div 260 + 14^2 = ?$
 (a) 284 (b) 272 (c) 292 (d) 282
 (e) 201
- What should come in the place of '?' in the following question? **(SBI Clerk Prelim-2023)**
 $\sqrt{289} \times 5 + 25 \times 20\% \text{ of } 750 - 486 \div 3 = ?$
 (a) 2088 (b) 3415 (c) 3375 (d) 2812
 (e) 3673
- What should come in the place of the question mark '?' in the following question? **(SBI Clerk Prelim-2023)**
 $17\frac{4}{3} \div 3\frac{2}{3} + 6\frac{2}{3} \times \frac{3}{2} - 10.5\% \text{ of } 110 = ?$
 (a) 3.15 (b) 3.45 (c) 3.65 (d) 4.25
 (e) 4.75
- What value will come in the place of '?' in the following question? **(SBI Clerk Prelim-2023)**
 $24\% \text{ of } 840 + 64\% \text{ of } 940 = 32\% \text{ of } ?$
 (a) 3210 (b) 3010 (c) 2310 (d) 2510
 (e) 2810
- It is given that $a^a b^a (c^d + d^c) = c^d d^c (a^b + b^a)$. Which of the following can be concluded. **(SBI PO Main-2023)**
 - For $(a, b, c, d) \neq 0$, $\frac{1}{b^a} + \frac{1}{a^b} = \frac{1}{c^d} + \frac{1}{d^e}$
 - If $a^b - d^c = 0$, then, c^d must be equal to b^a , for all real values of a, b, c and d .
 - Given $c = 0$, then, $a^b + b^a = 1$ given d is non zero

- (a) Only 1 (b) Only 1 & 2
 (c) All 1, 2 & 3 (d) Only 2 & 3
 (a) None of the above

DIRECTIONS (Qs. 17-31): What should come in place of question mark (?) in the following question?
(RRB Office Asst. Prelim-2023)

17. $275 - 12 \times \sqrt{49} + 552 \div 23 = ?$
 (a) 215 (b) 235 (c) 230 (d) 225
 (e) None of these
18. $70\% \text{ of } 450\% + 30\% \text{ of } 230 = ? \times 20\%$
 (a) 1960 (b) 1920 (c) 1760 (d) 1840
 (e) 2130
19. $22 \div 9 \div 7 \times 189 + 234 = ?$
 (a) 254 (b) 300 (c) 314 (d) 298
 (e) 321
20. $61 \times 35 - 18 \times 35 = ? + 60$
 (a) 1505 (b) 1495 (c) 1445 (d) 1475
 (e) None of these
21. $2197 \div 13 + 95 \times 114 = ?$
 (a) 9485 (b) 9481 (c) 10205 (d) 10999
 (e) 10106
22. $35\% \text{ of } 180 + 50\% \text{ of } 300 = 40\% \text{ of } ?$
 (a) 420 (b) 351.5 (c) 532.5 (d) 605
 (e) 516.5
23. $(\sqrt{1156} \times 30) \div 17 + 16^2 = ?$
 (a) 282 (b) 276 (c) 324 (d) 316
 (e) None of these
24. $9 \times 2.5 \div 4 - 3.6 \times 1.5 = ?$
 (a) 120/40 (b) 129/30 (c) 121/40 (d) 129/50
 (e) 121/45
25. $[(84)^2 \div 28 \times 8] \div 28 = 6 \times ?$
 (a) 13 (b) 14 (c) 15 (d) 11
 (e) 12
26. $3430 \div 49 - 5 \times 7.4 = ?$
 (a) 33 (b) 37 (c) 31 (d) 32
 (e) 29
27. $80\% \text{ of } 200 - 30 + 50\% \text{ of } 40 - 18 = ?$
 (a) 72 (b) 94 (c) 132 (d) 100
 (e) 88
28. $(\sqrt[3]{1331} \times \sqrt{144}) \div 3 + 4 = ?$
 (a) 37 (b) 48 (c) 50 (d) 51
 (e) 45
29. $1500 - 6\% \text{ of } 800 - 19 \times 6 = ?$
 (a) 1156 (b) 1242 (c) 1300 (d) 1338
 (e) None of the above
30. $16 \times 14 \div 7 \div 32 + 3^2 = ?$
 (a) 11 (b) 17 (c) 10 (d) 9
 (e) 13
31. $\sqrt[3]{512} \div 8 \text{ of } 4 + \sqrt{36} \div \sqrt{9} = \sqrt{?}$
 (a) 64/9 (b) 25/16 (c) 49/9 (d) 9/16
 (e) None of these

DIRECTIONS (Qs. 32-43): What value will come in the place of the question mark '?' in the following question?

(RBI Assist. Prelim-2023)

32. $25 \times 100 - 20 \times 800 + 70 \div 7 = ? \times 50 \div 10$
 (a) -2758 (b) -2698 (c) -2298 (d) -2289
 (e) -2739
33. $\sqrt{256} - \sqrt{169} \times 7 + 17 \times 10 + 137 - 19 = ?$
 (a) 215 (b) 213 (c) 222 (d) 207
 (e) None of these
34. $35\% \text{ of } 400 + 4 \times ? = 50\% \text{ of } 1200$
 (a) 122 (b) 113 (c) 115 (d) 127
 (e) 125
35. $56 \times 45 + 145 \times 58 + 95 \times 13 = ? - \sqrt{324}$
 (a) 12515 (b) 12616 (c) 12826 (d) 12813
 (e) None of these
36. $25\% \text{ of } 700 + 66\% \text{ of } 500 = ? + 52\% \text{ of } 400$
 (a) 306 (b) 310 (c) 297 (d) 300
 (e) 295
37. $1650\% \text{ of } ? \div 330 + 150\% \text{ of } 500 \div 75 = 25$
 (a) 305 (b) 298 (c) 300 (d) 310
 (e) 295
38. $(35 + 72 - 56) + \left(\frac{136}{17} \times 3\right) = ? + 19$
 (a) 54 (b) 56 (c) 60 (d) 58
 (e) 68
39. $104 \times 12 + 283 + 650 - 25 \times 17 = ?$
 (a) 1760 (b) 1756 (c) 1744 (d) 1749
 (e) None of these
40. $[1400 \div 35 \times 5 + (560 \div 70)] = ?$
 (a) 200 (b) 198 (c) 208 (d) 210
 (e) 214
41. $\sqrt{3025} \div 11 \times 3 \text{ of } (17 - 9) + 50 = ?$
 (a) 158 (b) 160 (c) 165 (d) 170
 (e) None of these
42. $38 - \{(17 - 5 \text{ of } 3 \times 2) + 6 \text{ of } 5\} = ?$
 (a) 28 (b) 43 (c) 36 (d) 21
 (e) 35
43. $480 - (35 \times 6) = ?^2 - 100\% \text{ of } 91$
 (a) 17 (b) 13 (c) 21 (d) 19
 (e) 23
44. $6^{3/2} \div (36 \times \sqrt{24}) = ? \div 180$ **(IBPS Clerk Prelim-2023)**
 (a) 8 (b) 10 (c) 12 (d) 15
 (e) 5
45. $20 \times 8 \div 4 - 27 = ?$ **(IBPS Clerk Prelim-2023)**
 (a) 24 (b) 9 (c) 13 (d) 15
 (e) 18
46. $65 \div 13 \times 58 - ?^2 = 254$ **(IBPS Clerk Prelim-2023)**
 (a) 9 (b) 6 (c) 7 (d) 8
 (e) 4
47. $\sqrt{676} - 31 + 261 \div 29 = ?$ **(IBPS Clerk Prelim-2023)**
 (a) 2 (b) 7 (c) 6 (d) 4
 (e) 5

48. $430 + 55 \times 6 - 9^2 = ?$ (IBPS Clerk Prelim-2023)
 (a) 450 (b) 571 (c) 679 (d) 429
 (e) 532
49. $90 \div 18 \times ? - 15^2 = 500$ (IBPS Clerk Prelim-2023)
 (a) 138 (b) 154 (c) 185 (d) 145
 (e) 164
50. $40 \times 25 + 3.5 \times 80 = 1287 - ?$ (IBPS Clerk Prelim-2023)
 (a) -8 (b) -10 (c) -7 (d) -11
 (e) 7
51. $5\frac{4}{19} \times 114 - 458 = ? \times 17$ (IBPS Clerk Prelim-2023)
 (a) 3 (b) 6 (c) 7 (d) 4
 (e) 8
52. $117 \div 13 + 2197 \div 13^2 = ?$ (IBPS Clerk Prelim-2023)
 (a) 12 (b) 17 (c) 19 (d) 15
 (e) 22
53. $\sqrt{28900} \div 10 + 36 \div 9 + ? = 91$ (IBPS Clerk Prelim-2023)
 (a) 70 (b) 64 (c) 60 (d) 53
 (e) 56
54. $280 + 450 - 220 = ? - 700$ (IBPS Clerk Prelim-2023)
 (a) 1184 (b) 1210 (c) 1010 (d) 1120
 (e) 1150
55. $195 \div 13 - 240 + 80 = 520 - ?$ (IBPS Clerk Prelim-2023)
 (a) 695 (b) 680 (c) 686 (d) 665
 (e) 658
56. $15 \times 12 + ? - 343 \div 7 = 159$ (IBPS Clerk Prelim-2023)
 (a) 24 (b) 16 (c) 28 (d) 21
 (e) 18
57. $800 \times 5 \div 16 + ? = 430$ (IBPS Clerk Prelim-2023)
 (a) 260 (b) 320 (c) 230 (d) 140
 (e) 180
58. $525 + 32 \times 5 \div ? = 845$ (IBPS Clerk Prelim-2023)
 (a) 1 (b) 3 (c) 2 (d) 8
 (e) 0.5

Approximation

DIRECTIONS (Qs. 1-2): What approximate value should come in place of the question mark(?) in the following question?
 (SBI Clerk Mains-2023)

1. $? \times 8.23 + 44.89\% \text{ of } 80.31 = 32.92 \times 4.14$
 (a) 8 (b) 12 (c) 16 (d) 20
 (e) 14
2. $25.12 \times 4.29 \div 5.19 + 16.16 + (7.91)^2 = ?^2$
 (a) 10 (b) 8 (c) 9 (d) 5
 (e) 12

DIRECTIONS (Qs. 3-4): What approximately value should come in the place of the question mark (?) in the following equation?
 (SBI Clerk Mains-2023)

3. $18.17 \times 4.23 + (24.97 \div 5.31) - 33.24 = ?$
 (a) 50 (b) 51 (c) 44 (d) 40
 (e) 47
4. $70.39 - 20.19 \times 1.91 + 36.41 \times 1.17 = ?$
 (a) 60 (b) 66 (c) 76 (d) 73
 (e) 81

5. What approximate value should come in place of x in the following question? (RRB Office Asst. Main-2023)

$$23\frac{2}{3}\% \text{ of } \sqrt{323.91} + (11.97^2 \div \sqrt[3]{26.949})\% \text{ of } \sqrt{1679}$$

$$= 30\% \text{ of } x + 2.87$$

- (a) 64 (b) 70 (c) 82 (d) 42
 (e) None of these

6. What approximate value should come in place of the question mark (?) in the following question?

$$\left(\frac{\sqrt{120.77} \div 11 + \sqrt{64.03}}{2.98} \right) \frac{14.98}{2.94} = ?$$

(RRB Office Asst. Main-2023)

- (a) 21 (b) 15 (c) 28 (d) 9
 (e) None of these

7. What approximate value should come in the place of the question mark '?' in the following question?

$$124.83 \times 63.82 \div 24.94 + 168.79 \times 13.96 \div 12.98 + 122.96 = ?^2$$

(RRB Office Asst. Main-2023)

- (a) 28 (b) 32
 (c) 16 (d) 9
 (e) None of these

8. Find the value of x in the following question given below

$$(\sqrt{440.98/7} \times 11.98) - 24.98\% \text{ of } 399.98 + (15.89 \times 17.89)$$

$$- (\sqrt[3]{1727.79} \times 5.09) - (16.09 \times 34.98) / 7 = x$$

(RRB Office Asst. Main-2023)

- (a) 84 (b) 64 (c) 81 (d) 32
 (e) None of these

9. Which of the following approximate value will replace the question mark?
 (RRB Office Asst. Main-2023)

$$(516.92 + 37.04 + 471.93) / 113.98 * ? = 576.05$$

- (a) 48 (b) 52 (c) 64 (d) 72
 (e) None of these

DIRECTIONS (Qs. 10-14): What approximate value should come in place of the question mark (?) in the following questions? (You are not expected to calculate the exact value.)
 (RBI Asst. Mains-2023)

10. $\sqrt{898} \times (12.005)^2 + ? = 5000$
 (a) 680 (b) 720 (c) 750 (d) 620
 (e) 630
11. $3745 \div 24.05 \times 17.98 = ?$
 (a) 2860 (b) 2800 (c) 2760 (d) 2720
 (e) 2840
12. $1002 \div 49 \times 99 - 1299 = ?$
 (a) 700 (b) 600 (c) 900 (d) 250
 (e) 400
13. $29.8\% \text{ of } 260 + 60.01\% \text{ of } 510 - 103.57 = ?$
 (a) 450 (b) 320 (c) 210 (d) 280
 (e) 350
14. $(21.98)^2 - (25.02)^2 + (13.03)^2 = ?$
 (a) 25 (b) 120 (c) 10 (d) 65
 (e) 140

DIRECTIONS (15-19): What approximate value should come in the place of ? mark. **(IBPS Clerk Mains-2023)**

15. $?^2 * 18.66 - 384.76 = 8.32^3 + 229.28$
 (a) 9 (b) 11 (c) 8 (d) 12
 (e) 15
16. $29.89\% \text{ of } 298 + 44.71\% \text{ of } 197 = \sqrt{?} + 163.55$
 (a) 256 (b) 248 (c) 272 (d) 304
 (e) 236
17. $48.42 * 10.25 + 3.18 + 34.401^2 = ? * 47.22$
 (a) 30 (b) 35 (c) 24 (d) 28
 (e) 39
18. $\sqrt{2301} * 18.25 + \sqrt{(18.34 + 16.27 + 3.44 * 4.98)}$
 (a) 847 (b) 863 (c) 851 (d) 871
 (e) 856
19. $(\sqrt{15.03} + \sqrt{24.99})^2 + 141.07 - 2\sqrt{396} = ?^2 - 107$
 (a) 31 (b) 23 (c) 17 (d) 21
 (e) 13

Series

1. Find the wrong term in the following series.
 150, 141, 131, 120, 110, 95 **(SBI Clerk Prelim-2023)**
 (a) 141 (b) 131 (c) 110 (d) 120
 (e) 95
2. Find the wrong term in the following series.
 50, 72, 98, 128, 164, 200 **(SBI Clerk Prelim-2023)**
 (a) 50 (b) 72 (c) 164 (d) 200
 (e) 98
3. Find the wrong term in the following series.
 81 118 151 180 197 206 **(SBI Clerk Prelim-2023)**
 (a) 81 (b) 118 (c) 151 (d) 180
 (e) 197
4. Find the wrong term in the following series.
 10 10 20 25 240 1200 **(SBI Clerk Prelim-2023)**
 (a) 10 (b) 20 (c) 25 (d) 240
 (e) 1200
5. Find the wrong term in the given series.
 5 8 17 25 37 48 **(SBI Clerk Prelim-2023)**
 (a) 17 (b) 5 (c) 37 (d) 8
 (e) 25

DIRECTIONS (Qs. 6-7): The Series contains one wrong and one missing number. **(SBI Clerk Mains-2023)**

0.5, 6, 84, 840, 6720, 40320, a

6. What is the value of a - 112809
 (a) 41000 (b) 43245 (c) 48471 (d) 52231
 (e) 45325
7. Find the wrong number of the given series.
 (a) 84 (b) 6 (c) 6720 (d) 840
 (e) 40320

DIRECTIONS (Qs.8-10): In this question, two equations are given. Answer the questions based on given equations:

(SBI Clerk Mains-2023)

- I. $a, b, c, 707, 563, 627, 611$
 II. $x, x + 18, 433, 451, 469, y$
8. Which of the following are true?
 (i) $y = a + b$ (ii) $y = 446 + \left(\frac{1}{11}\right)C$
 (iii) $x + b = \frac{1}{2}(y)$
 (a) Only (ii) (b) Only (iii)
 (c) Only (i) and (iii) (d) Only (ii) and (iii)
 (e) All of these
9. If the sum of $z + y = 576$, then find the average of 'c' and 'z'.
 (a) 300 (b) 270 (c) 220 (d) 200
 (e) 250
10. Had 'a' been divided by the second largest single digit prime number, then resultant would be....
 (a) 45 (b) 38 (c) 55 (d) 50
 (e) 40

DIRECTIONS (Qs. 11-16): What should come in place of question Mark '?' in the following number series?

(SBI PO Prelim-2023)

11. 400, ?, 198, 296, 591, 1476.5
 (a) 215.5 (b) 200.5 (c) 199 (d) 201
 (e) None of these
12. 715, ?, 306, 526, 795, 1100
 (a) 150 (b) 125 (c) 135 (d) 200
 (e) None of these
13. 34, ?, 373, 436, 462, 469
 (a) 283 (b) 229 (c) 249 (d) 253
 (e) None of these
14. 27, 40, 23, 36, 19, 32, ?
 (a) 13 (b) 19 (c) 16 (d) 15
 (e) None of these
15. 30, ?, 33.6, 40.8, 69.6, 213.6
 (a) 30.4 (b) 31.2 (c) 30.5 (d) 30.2
 (e) None of these
16. 30, 49, 72, 101, ?, 185
 (a) 137 (b) 133 (c) 138 (d) 131
 (e) None of these

DIRECTIONS (Qs.17-21): What should come in place of the question mark '?' in the following number series?

(RRB Office Asst. Prelim-2023)

17. 6, ?, 54, 162, 486, 1458
 (a) 22 (b) 21 (c) 20 (d) 19
 (e) 18
18. 20, ?, 40, 76, 140, 240
 (a) 32 (b) 24 (c) 26 (d) 28
 (e) 30

19. 6, 8, 18, 56, ?, 1132
 (a) 272 (b) 262 (c) 250 (d) 226
 (e) 242
20. 41, 60, 83, 112, ?, 180
 (a) 136 (b) 139 (c) 143 (d) 148
 (e) 160
21. 109, 113, 127, ?, 137, 139
 (a) 131 (b) 132 (c) 133 (d) 129
 (e) 134
22. Find the missing term in the given series.
(RRB Office Asst. Main-2023)
 40, ?, 91, 216, 432, 775
 (a) 88 (b) 78 (c) 67 (d) 82
 (e) None of these
23. Find the missing term in the given series.
(RRB Office Asst. Main-2023)
 85, 115, 75, 125, 65, 135, ?
 (a) 110 (b) 80 (c) 45 (d) 55
 (e) None of these
24. Find the missing term in the given series.
(RRB Office Asst. Main-2023)
 734, 613, 469, 300, 104, ?
 (a) 21 (b) -121 (c) 37 (d) -41
 (e) None of these
25. Find the missing term in the given series.
(RRB Office Asst. Main-2023)
 ?, 280, 1680, 8400, 33600, 100800
 (a) 40 (b) 65 (c) 70 (d) 35
 (e) None of these
26. What should come in place of the question mark (?) in the following number series? **(RRB Office Asst. Main-2023)**
 51, 106, 183, 282, 403, (?)
 (a) 806 (b) 603 (c) 627 (d) 546
 (e) None of these
27. Find the missing term in the given series.
(RRB Office Asst. Main-2023)
 2000, 1800, 1700, 1600, ?, 600
 (a) 1400 (b) 1425 (c) 1500 (d) 1450
 (e) None of these

DIRECTIONS (Qs. 28-32): Find the missing number in the following series. **(RRB Officer Scale-I Prelim-2023)**

28. 6400, 400, 50, 12.5, 6.25, ?, 12.5
 (a) 2.75 (b) 3.125 (c) 6.25 (d) 5.5
 (e) None of these
29. 3, ?, 27, 112, 565, 3396, 23779
 (a) 5 (b) 6 (c) 7 (d) 8
 (e) None of these
30. 4, 6, 12, 30, 90, ?, 1260
 (a) 315 (b) 290 (c) 275 (d) 330
 (e) None of these
31. 14, 16, 12, 18, 10, ?, 8
 (a) 22 (b) 20 (c) 16 (d) 14
 (e) None of these

32. 19, 23, 32, 48, ?, 109, 158
 (a) 70 (b) 68 (c) 76 (d) 82
 (e) None of these

DIRECTIONS (Qs. 33-35): Solve the following quadratic equations and choose the correct answer from the options given below: **(RRB Officer Scale-I Mains-2023)**

33. $a = 3b, \sqrt{(a^2 + b^2)} = 4\sqrt{10}$
 I. $x^2 - (a+b)x + 39 = 0$
 II. $y^2 - (1.5a - 0.25b)y + 72 = 0$
 (a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
 (e) $x = y$ or can not be determined
34. LCM of a and b is 88 and HCF is 1 and $1 < a < b$.
 I. $x^2 - ax - 105 = 0$
 II. $y^2 + by + 6y + 72 = 0$
 (a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
 (e) $x = y$ or can not be determined
35. I. $x^3 + 2x^2 - 99x = 0$
 II. $y^3 + 4y^2 - 117y = 0$
 (a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
 (e) $x = y$ or can not be determined

DIRECTIONS (Qs. 36-40): Find the missing number, to replace the question mark, from the given alternatives: **(RRB Officer Scale-I Mains-2023)**

36. 2, 4, 11, 39, ?, 228
 (a) 98 (b) 102 (c) 107 (d) 112
 (e) None of these
37. 110, 112, 117, 127, 144?
 (a) 164 (b) 162 (c) 176 (d) 170
 (e) None of these
38. 7, 21, 44, 94, ?, 599
 (a) 218 (b) 230 (c) 225 (d) 241
 (e) None of these
39. 6, 14, ?, 62, 126, 254,
 (a) 26 (b) 30 (c) 32 (d) 28
 (e) None of these
40. 2, 26, ?, 2002, 10010, 30030
 (a) 286 (b) 272 (c) 290 (d) 276
 (e) None of these

DIRECTIONS (Qs. 41-45): What should come in place of the question mark (?) in the following number series? **(RBI Asst. Mains-2023)**

41. 563, 647, 479, 815, ?
 (a) 672 (b) 386 (c) 279 (d) 143
 (e) None of these
42. 13, 32, 24, 43, 35, ?, 46, 65, 57, 76
 (a) 45 (b) 52 (c) 54 (d) 55
 (e) None of these
43. 11 57 149 333 701 (?)
 (a) 1447 (b) 1347 (c) 1368 (d) 1437
 (e) None of these

44. 697 553 453 389 353 (?)
 (a) 328 (b) 337 (c) 362 (d) 338
 (e) None of these
45. 4000 2008 1012 ? 265 140.5 78.25
 (a) 506 (b) 514 (c) 520 (d) 512
 (e) None of these
46. What should come in place of (?) in the given series?
(IBPS PO Prelim-2023)
 10, 22, 37, 47, ?, 70
 (a) 62 (b) 64 (c) 68 (d) 67
 (e) 69
47. What should come in the place of (?) in the given series?
 1000, 100, 20, 6, 2.4, ? **(IBPS PO Prelim-2023)**
 (a) 0.4 (b) 0.8 (c) 0.3 (d) 1.2
 (e) 1.4
48. What should come in the place of (?) in the given series?
 100, 159, 220, 287, 358, ?, 510 **(IBPS PO Prelim-2023)**
 (a) 431 (b) 463 (c) 471 (d) 464
 (e) 4723
49. What should come in the place of (?) in the given series?
 50, 62, 87, 138, 241, ? **(IBPS PO Prelim-2023)**
 (a) 442 (b) 445 (c) 449 (d) 441
 (e) 448
50. What should come in the place of (?) in the given series?
 100, 126, 176, 258, ?, 550 **(IBPS PO Prelim-2023)**
 (a) 380 (b) 510 (c) 490 (d) 500
 (e) 495

DIRECTIONS (Qs. 51-52): Study the given information carefully and answer the following questions below.
(IBPS PO Mains-2023)

$$\sqrt[n]{Z} 29, A, X, 437, A + 687, 1294 / \sqrt[n]{Z}$$

Note: n is a positive integer

Difference between 29 and A is P, which has 3 factors excluding P itself, those are 13, 5, Z

51. What is the value of Z + X?
 (a) 441 (b) 511
 (c) 431 (d) 221
 (e) None of the above
52. What is the LCM of A + 20 and Z?
 (a) 114 (b) 100
 (c) 224 (d) 360
 (e) None of the above

DIRECTIONS (Qs. 53-55): Study the given information carefully and answer the following questions below.
(IBPS PO Mains-2023)

Series I: 60 120 24 48 9.6 19.2

Series II: 100 A B C D 32

Note: Both the number series follow the same pattern

53. Find the difference between (C + B) and (C + D)
 (a) 16 (b) 18
 (c) 12 (d) 24
 (e) None of the above
54. If a new series starts with the value of (A - B) following the same logic mentioned in the above series, then what is the 3rd term of the newly formed series?

- (a) 256 (b) 32
 (c) 64 (d) 128
 (e) None of the above
55. If roots of a quadratic equation are C/A and (A-B)/16, then, quadratic equation is,
 (a) $x^2 - 32/5x + 8/25 = 0$ (b) $x^2 - 87/4x + 3 = 0$
 (c) $x^2 - 52/5x + 4 = 0$ (d) $x^2 - 90/5x + 7/11 = 0$
 (e) None of the above

DIRECTIONS (Qs. 56-57): Study the given information carefully and answer the following questions below.
(IBPS PO Mains-2023)

Series I: 808 520 352 232 X 160

Series II: 500 260 140 100 Y 88

56. Find the value of X - 12²?
 (a) 48 (b) 44 (c) 24 (d) 40
 (e) None of the above
57. Find the average of Y, Y + 12, Y + 36
 (a) 109 (b) 108 (c) 107 (d) 106
 (e) None of the above

DIRECTIONS (Qs. 58-62): Find out of the wrong number in the following number series. **(IBPS Clerk Prelim-2023)**

58. 590, 302, 159, 86, 50, 32, 23
 (a) 50 (b) 32 (c) 302 (d) 159
 (e) 86
59. 21.5, 26, 29.5, 35, 41.5, 49
 (a) 41.5 (b) 49 (c) 26 (d) 35
 (e) 29.5
60. 180, 268, 234, 316, 226, 364
 (a) 364 (b) 268 (c) 234 (d) 276
 (e) 316
61. 160, 329, 554, 825, 1204, 1645
 (a) 329 (b) 1204 (c) 1645 (d) 825
 (e) 554
62. 250, 242, 230, 218, 198, 170
 (a) 198 (b) 230 (c) 218 (d) 242
 (e) 170

DIRECTIONS (63-64): Consider the following number series and answer the question based on this.
(IBPS Clerk Mains-2023)

1, ?, 2, 18, 1152, 720000

63. If a is the missing term of the series then what is the value of 75% of a?
 (a) 1.75 (b) 2 (c) 1.25 (d) 0.75
 (e) 1.50
64. Find value of 6b If ratio of b and a = 2: 3
 (a) 6 (b) 8 (c) 4 (d) 12
 (e) 18

DIRECTIONS (65-66): Find the wrong number.
(IBPS Clerk Mains-2023)

65. 4.6, 11.5, 13.8, 34.5, 103.5, 362.25, 1449
 (a) 13.8 (b) 11.5 (c) 362.25 (d) 103.5
 (e) 34.5
66. 2.2, 28.6, 2.6, 18.2, 3.64, 7.28, 5.46
 (a) 7.28 (b) 3.64 (c) 28.6 (d) 5.46
 (e) 18.2

67. The series given below contains a missing number 'A'. Find the value of 'A' and determine which among the given three statement(s) is/are true. **(RBI Grade B-2023)**
 148, 364, 315, 827, 746, 'A', 1625
 I. The nearest perfect square number to 'A' is 1764
 II. 'A' is divisible by 13
 III. A + 54 is multiple of 75.
 (a) Only I and III (b) Only II
 (c) Only I and II (d) Only II and III
 (e) Only III
68. Given below are two number series I and II where the missing numbers in series I and II are 'M' and 'N', respectively. Find the value of 'M' and 'N' and find which among the given options gives the correct value of (M-N) **(RBI Grade B-2023)**
 I. 2500, 2000, 1500, 1050, M, 409.5
 II. 5, 8, 21, 80, N, 2364
 (a) 1120.5 (b) 1090.5 (c) 980.5 (d) 287.5
 (e) 105.5
69. Given below are two number series I and II where the missing numbers in series 'I' and 'II' are 'A' and 'B', respectively. Find the value of 'A' and 'B' and find which among the given options gives the L.C.M of 'A' and 'B'. **(RBI Grade B-2023)**
 I. 47, 76, 18, A, -11, 134 II. 120, 77, B, 42, 50, 75
 (a) 1080 (b) 1200
 (c) 1785 (d) 960
 (e) 1440

Equations and Inequations

1. In this question, two equations are given. Answer the questions based on given equations: **(SBI Clerk Mains-2023)**
 I. $2x^2 - Mx + 10 = 0$
 a and b are two roots of the given equation and their sum is $a + b = 4.5$ ($a > b$)
 II. $4y^2 - Ny + 19 = 0$
 c and d are two roots of the given equation such as one root is 40% of the largest root of first equation. ($c > d$)
 Which of the following statements is are correct?
 I. Values of $a + c = b + d$ II. $c + d = 5.75$
 III. $a > b > c > d$
 (a) Only I (b) Only III
 (c) Only II (d) All of these
 (e) None of these
2. In this question, two equations are given, answer the questions based on given equations: **(SBI Clerk Mains-2023)**
 I. $x^2 - 12x + 32 = 0$
 II. $x^2 - 26x + 169 = 0$
 If one of the roots of given equation is taken from both equation, a new equation is formed which is:
 (a) $x^2 + 10x + 36 = 0$ (b) $x^2 - 17x + 52 = 0$
 (c) $x^2 - 17x - 52 = 0$ (d) $x^2 + 21x - 104 = 0$
 (e) $x^2 - 16x + 63 = 0$
3. $3x^2 - 26x + n = 0$ **(SBI Clerk Mains-2023)**
 Roots of the given equation are l and m, where, $l > m$ and $m = 8/3$.

- Which of the following/s is/are true?
 I. HCF of n and l is equal to 50% more than m
 II. Value of n is a perfect cube
 III. n is multiple of l.
 (a) Only I and II (b) Only II
 (c) Only II (d) Only I and III
 (e) All of these
4. In the given question, two equations numbered I and II are given. Solve both the equations and mark the appropriate answer. **(SBI PO Prelim-2023)**
 I. $x^2 + 2x - 63 = 0$ II. $y^2 - 2y - 24 = 0$
 (a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
 (e) $x = y$ or relation between x and y can not be established.
5. In the given question, two equations numbered I and II are given. Solve both the equation and mark the appropriate answer. **(SBI PO Prelim-2023)**
 I. $x^2 - 11x + 18 = 0$
 II. $y^2 - 6y - 27 = 0$
 (a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
 (e) $x = y$ or relation between x and y can not be established.
6. In the given question, two equations numbered I and II are given. Solve both the equation and mark the appropriate answer. **(SBI PO Prelim-2023)**
 I. $x^2 - 50x + 49 = 0$ II. $y^2 - 48y + 47 = 0$
 (a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
 (e) $x = y$ or relationship between x and y cannot be established.
7. In the given question, two equations numbered I and II are given. Solve both the equations and mark the appropriate answer. **(SBI PO Prelim-2023)**
 I. $x^2 + 4x + 3 = 0$ II. $y^2 + 6y + 9 = 0$
 (a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
 (e) $x = y$ or relationship between x and y cannot be established.
8. In the given question, two equations numbered I and II are given. Solve both the equations and mark the appropriate answer. **(SBI PO Prelim-2023)**
 I. $x^2 + 3x - 18 = 0$
 II. $y^2 - 7x + 12 = 0$
 (a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
 (e) $x = y$ or relationship between x and y cannot be established.

DIRECTIONS (Qs. 9-10): Read the following information and answer the questions given below: **(SBI PO Main-2023)**

9. Equation 1: $4x^2y + \left(-\frac{5}{2}\right)x + \frac{1}{2}y + 2^n + 1 = 0 +$
 Equation 2: $-3x^2y + \left(\frac{1}{8}\right)x + \frac{1}{2}y - 10 = 0$ is equal to
 Equation 3 : $x^2y - Bx + y - T = 0$
 n is the smallest whole number
 B and T is the integer

If $y = 1.4$ in equation 3, then which of the following is one of the root of the equation?

- (a) 2 (b) 3 (c) 4
(d) Can not be determined
(e) None of these
10. Which of the following is/are true? **(SBI PO Main-2023)**
- B is a prime number
 - B is one of the factor of T
 - product of B and 16 = 34
- (a) Only 1 and 3 (b) Only 2
(c) Only 2 and 3 (d) Only 1 and 2
(e) None of these
11. Find the correct combination regarding the roots of below given equation. **(RRB Office Asst. Main-2023)**
Equation: $3x^2 - 25x + 28 = 0$
- I. $\frac{3}{4}$ II. $\frac{4}{3}$ III. 7 IV. 6
- (a) Only I and IV (b) Only II and IV
(c) Only II and III (d) Only III and IV
(e) None of these
12. Find the product of smaller root of equation I and bigger root of equation II. **(RRB Office Asst. Main-2023)**
I: $3x^2 + x - 10 = 0$
II: $9x^2 - 31x + 12 = 0$
- (a) $\frac{4}{9}$ (b) 5 (c) $-\frac{4}{3}$ (d) -6
(e) None of these

DIRECTIONS (Qs. 13-15): In each of these questions, two equations (I) and (II) are given. You have to solve both the equations and give answer. **(RRB Officer Scale-I Prelim-2023)**

- (a) if $x > y$ (b) if $x \leq y$ (c) if $x \geq y$ (d) if $x < y$
(e) if $x = y$ or relationship between x and y can't be established
13. I. $2x - 6y = 12$ II. $3y + 2x = 24$
14. I. $x^3 - 29 - 1699 = 0$ II. $3y^2 - 581 - 449 = 0$
15. I. $3x^2 + 4x - 32 = 0$ II. $4y^2 + 5y - 51 = 0$

DIRECTIONS (Qs. 16-20) In the following question, two equations numbers I and II are given. you have to solve both equations and give the answer. **(RBI Assist. Prelim-2023)**

16. **(I)** $x^2 + 8x + 16 = 0$
(II) $y^2 - 6y + 9 = 0$
(a) $x \geq y$ (b) $x \leq y$ (c) $x > y$ (d) $x < y$
(e) $x = y$ or the relation can not be established
17. **(I)** $x^2 - 6x - 112 = 0$
(II) $y^2 + 3y - 40 = 0$

- (a) $x \leq y$ (b) $x > y$ (c) $x \geq y$ (d) $x < y$
(e) $x = y$ or the relation can not be established
18. **(I)** $x^2 - 4x - 252 = 0$
(II) $y^2 - 2y - 48 = 0$
(a) $x = y$ or the relation can not be established
(b) $x \geq y$ (c) $x < y$ (d) $x \leq y$
(e) $x > y$
19. **(I)** $2x^2 + 5x - 52 = 0$ **(II)** $2y^2 + 9y - 45 = 0$
(a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
(e) If $x = y$ or the relation can not be established
20. **(I)** $7x^2 + 18x + 8 = 0$
(II) $9y^2 - 15y + 4 = 0$
(a) $x < y$ (b) $x > y$ (c) $x \leq y$ (d) $x \geq y$
(e) $x = y$ or the relation can not be established
21. In the given question, two equation I and II are given. Solve both the equations and mark the appropriate answer. **(IBPS PO Prelim-2023)**
- I. $3x^2 - 10x + 8 = 0$ II. $2y^2 - 9y + 10 = 0$
(a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
(e) Relation can't be formed or $x = y$
22. In the given question, two equations numbered I and II are given. Solve both the equations and mark the appropriate answer. **(IBPS PO Prelim-2023)**
- I. $2x^2 - 9x + 9$ II. $2y^2 - 7y + 6$
(a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
(e) relation can't be established or $x = y$

DIRECTIONS (Qs. 23-25): Study the given information carefully and answer the following questions below. **(IBPS PO Mains-2023)**

- P: $(x-2)^2 = (-3x^2) + 2^2 + 25x - A$
Q: $(10y^2 - 3^2y + 2/3)(3) + 10y = 0$
One factor of equation P is 5
23. $7A \div 21 \times 0.2A - 89$ is equal to,
(a) $A + 1$ (b) $A + 2$
(c) $2A + 1$ (d) $2A - 1$
(e) None of the above
24. Smaller root of equation P when multiplied by largest one digit prime number gives,
(a) $17\frac{1}{3}$ (b) $15\frac{3}{4}$ (c) $16\frac{3}{4}$ (d) $12\frac{1}{2}$
(e) $13\frac{1}{3}$
25. Which of the following are the roots of equation Q?
(a) $1/3, 2/3$ (b) $1/5, 1/3$
(c) $3/5, 2/5$ (d) $2/5, 1/6$
(e) None of the above

26. $\sqrt{(y+45-mn)^4} = 5y+Q$ (IBPS PO Mains-2023)

One of the roots is -10

Where m and n are the roots of equation $x^2 - 11x + 30 = 0$

Quantity 1: $Q^{4/5}$

Quantity 2: $Q/2^2$

(a) Quantity 1 > Quantity 2

(b) Quantity 1 < Quantity 2

(c) Quantity 1 \geq Quantity 2

(d) Quantity 1 \leq Quantity 2

(e) Quantity 1 = Quantity 2 or can not be determined

27. Highest root of equation $6x^2 + 13x + 6 = 0$ is n, then find the value of 125^n (IBPS Clerk Mains-2023)

(a) $\frac{1}{25}$ (b) 0.50 (c) 5 (d) $\frac{1}{5}$

(e) 25

DIRECTIONS (28-30): In this question two equations numbered I and II are given. You have to solve both the equations and find out the correct option. (IBPS Clerk Mains-2023)

- (a) $x > y$ (b) $x < y$ (c) $x \geq y$ (d) $x \leq y$
 (e) $x = y$ or no relationship could be established

28. (I) $x^2 - 5\frac{1}{2}x + 7\frac{1}{2} = 0$

(II) $\frac{1}{\frac{1}{y^2 - 2y + 1.75}} = 2y - 2$

29. (I) $x^2 - 4\sqrt{7}x + 21 = 0$

(II) $2y^2 - 8\sqrt{5}x - 50 = 0$

30. (I) $x^2 - 37\sqrt{2}x + 140 = 0$

(II) $y^2 + 13\sqrt{3}y + 120 = 0$

31. Given below are 3 equations I, II and III where 'a' and 'b' are the roots of equation I where ($a < b$) and 'c' and 'd' are roots of equation II where ($c < d$). On this basis, solve for equation III and find the relationship between 'm' and 'n' given that $n = 11$ (RBI Grade B-2023)

I. $3x(x-12) + 72 = x^2 - 11x - 5$

II. $5y(y-3) - 64 = y(3y-2) - 19$

III. $(m+2a-d)^2 = 169$

(a) $m > n$

(b) $m < n$

(c) $m = n$ or the relationship cannot be established

(d) $m \geq n$

(e) $m \leq n$

32. Given below are three equation i.e. 'I', 'II' and III. If roots of the equation 'I' are 'a' and 'b' respectively such that $a > b$ while the roots of the equation 'II' are 'c' and 'd' respectively such that $c > d$, then find the value of 'T'. (RBI Grade B-2023)

I. $2x^2 - 6(x+4) = 3x + 11$

II. $2y^2 - 12(y-4) = 7y + 6$

III. $(15c/2) - 8b = 9a - 4d + T^2$

- (a) 11 (b) 4 (c) 7 (d) 9
 (e) 14

Number System, Average & Age

1. In an office, there are 15 staff members. Their average weight is 40 kg. When one of the staff members leaves the office, the average weight becomes 39 kg. If one new staff member join the average weight becomes 42 kg. Find the difference between the weight of the staff member who left the office and who join the office.

(SBI Clerk Prelim-2023)

- (a) 25 kg (b) 35 kg (c) 30 kg (d) 18 kg
 (e) 27 kg

2. The ratio of present age of A and B is 3 : 1 and the ratio of present age of A and C is 2 : 5. The difference between the present age of A and C is 4 years. 10 years hence, find the sum of there ages. (SBI Clerk Prelim-2023)

- (a) 70 (b) 64 (c) 60 (d) 56
 (e) 68

3. Given that the combined ages of two individuals, J and K is a^2 years, and the difference of their ages is '72 - 12a' years (with K being younger), and also the ratio of J's age two years ago to J's age ten years from now is 4 : 7. can you determine the average between J's age three years from now and K's age seven years ago?

(SBI Clerk Mains-2023)

- (a) $a + 12$ (b) $a + 10$
 (c) $a + 15$ (d) $a + 8$
 (e) None of these

4. Average weight of four friends 'J', 'K', 'L' and 'M' is a kg. When 'M' is replaced by 'N' then the average increases by 14.25 kg. When 'L' is replaced by 'N', average increases by 6.75 kg. If the average weight of 'L', 'M' and 'N' is 74 kg then the weight of 'N' is how much percent more than that of 'L'? (SBI Clerk Mains-2023)

- (a) 30% (b) 36%
 (c) 42% (d) 45%

5. In a classroom consisting of boys and girls, the average marks obtained by the girls is 90. If the average of the whole class is 92, and the ratio of the number of girls to that boys is 3 : 2, what is the average marks scored by the boys? (SBI PO Prelim-2023)

- (a) 97 (b) 94 (c) 96 (d) 95
 (e) None of these

6. 5 year ago, age of Lavi and the present age of Vinu is in the ratio of 4 : 5. After 7 years, the age of Lavi and Vinu will be in the ratio of 4 : 3. Find the age of Vinu after 10 years. (RRB Office Asst. Prelim-2023)

- (a) 18 years (b) 15 years
 (c) 20 years (d) 17 years
 (e) 16 years

7. Ratio of ages of John and Peter before 8 years was 5:6 and average of present ages of peter and Ali is 36 years. If age of Ali after 5 years will be some as the age of John before 5 years, find the present age of John. (RRB Office Asst. Main-2023)

(RRB Office Asst. Main-2023)

- (a) 34.5 years (b) 33 years
(c) 38 years (d) 42 years
(e) none of these
8. There are 3 consecutive odd numbers and 3 consecutive even numbers. The smallest even number is 9 more than largest odd number. If the square of average of all the 3 given odd number is 507 less than the square of the average of all the 3 given even number, what is the smallest odd number. **(RRB Office Asst. Main-2023)**
(a) 11 (b) 13 (c) 17 (d) 19 (e) 9
9. The average of the height of the 20 employee of the company is 1.5 m. In the month of June, two employees named Rajat and Khali left the company whose height are 1.4 m and 1.6 m respectively. In August, two more people left the company whose average of height is 1.7 m and one person join the company whose height is 87.5% of height of Khali. Before the December, more four people left the company whose height are 1.3 m, 1.1 m, 1.32 m and 1.25 m respectively and more 5 people join the company whose height are 1.26 m, 1.18 m, 1.39 m and 1.4 m respectively. The average of height in the month of September is **(RRB Office Asst. Main-2023)**
(a) 1.2 (b) 1.3 (c) 1.47 (d) 1.62
(e) 1.8
10. Average weight of 8 employees was A kg. Two new employees joined with the total weight of them being 151. Therefore average was increased by 1.5. The weight of the lightest new employee is $(A-5)$ kg. Then find the difference between the weights of two new employees. **(RRB Officer Scale-I Prelim-2023)**
(a) 25 kg (b) 28 kg
(c) 32 kg (d) 23 kg
(e) None of these
11. Sum of 4 consecutive multiples of 4 is 184. Find the smallest multiple. **(RRB Officer Scale-I Prelim-2023)**
(a) 36 (b) 40 (c) 44 (d) 52
(e) None of these
12. Average of present ages of J , K and L is 14 years. Average of ages of K , L and M , 4 years ago was 15 years. If the sum of present ages of J and M is 27 years, then find the age of M , 5 years hence. **(RRB Officer Scale-I Prelim-2023)**
(a) 28 years (b) 26 years
(c) 24 years (d) 30 years
(e) None of these
13. If the average of three even numbers in series 1 is 42. If the average of largest and second largest number is 45. The average of three odd numbers in series 2 is 39. If the average of largest and second largest number is 44. Find the sum of two shortest numbers of both the series. **(RRB Officer Scale-I Prelim-2023)**
(a) 77 (b) 72 (c) 68 (d) 65
(e) None of these
14. Set X: Set of 5 consecutive even numbers. Average of 2nd and last number is 385.
Set Y: Set of 5 consecutive odd numbers. Average of 1st and 4th number is 30 less than 1st number of set X.
Set Z: Set of 4 consecutive numbers, 2nd number is 6 less than the 1st number of set Y.
- Find the 1st number of set Z. All series are in increasing order. **(RRB Officer Scale-I Mains-2023)**
(a) 250 (b) 240 (c) 310 (d) 340
(e) 280
15. The present age ratio of person J to person K is 4:5. Two years from now, the age of person J will be $1\frac{2}{11}$ times the age that person K was eight years ago. What is the present age of person J? **(RBI Assist. Prelim-2023)**
(a) 25 years (b) 35 years
(c) 30 years (d) 24 years
(e) 20 years
16. There are four consecutive odd numbers, such that the average of the last and the first number is 12, find the difference between the second and the third number. **(RBI Assist. Prelim-2023)**
(a) 1 (b) 2 (c) 3 (d) 4
(e) 5
17. The sum of five consecutive even numbers of set A is 280. What is the sum of a different set B of five consecutive numbers whose lowest number is 71 less than double the lowest number of set A? **(RBI Asst. Mains-2023)**
(a) 182 (b) 165 (c) 172 (d) 175
(e) None of these
18. The respective ratio between the present age of Manisha and Deepali is 5 : X. Manisha is 9 years younger than Parineeta. Parineeta's age after 9 years will be 33 years. The difference between Deepali's and Manisha's age is same as the present age of Parineeta. What will come in place of X? **(RBI Asst. Mains-2023)**
(a) 23 (b) 39
(c) 15 (d) Cannot be determined
(e) None of these
19. The second lowest number of five consecutive odd number series is seven more than the $\frac{2}{5}$ th of the third highest number of five consecutive even numbers series. If the average of five consecutive even number series is 70, then find the difference between the highest number of both series. **(IBPS PO Prelim-2023)**
(a) 37 (b) 27 (c) 33 (d) 29
(e) 31
20. The present age of Father is two more than three times the present age of his daughter. 6 years hence, the ratio of ages of father and daughter becomes 8 : 3. If x is the square of the present age of daughter, then what will be the value of $(x + 2)$? **(IBPS PO Prelim-2023)**
(a) 550 (b) 581 (c) 588 (d) 578
(e) None of these
21. PQR is a three digit number, when PQR is multiplied by a single digit number A, then, the product is 2634. In that three digit number (PQR), the digit at tens place is equal to half of A. Which of the following is correct about PQR? **(IBPS PO Mains-2023)**
(1) Unit digit is 9 (2) is a prime number
(3) Sum of its digit is 16
(a) Only 1 and 3 (b) Only 1 and 2
(c) Only 3 (d) All 1, 2 and 3
(e) None of the above

22. A 4 digit odd number A whose unit digit is not 5 when divided by a prime number gives resultant as a three digit number B whose tens place is 0. Sum of digits of A is 8 while that of B is 5. Which of the following is correct about A and B. **(IBPS PO Mains-2023)**
 I. $A + B = 1624$
 II. Product of digits of A is equal to its sum of digits
 III. Difference between the thousand the place of A and B is 3.
 (a) Only I (b) Only I and II
 (c) All I, II, III (d) Only II and III
 (e) None of the above
23. The average age of five friends 84 years. If one new friend is added, then the average decreases by 4 years. Find the age of the new friend. **(IBPS Clerk Prelim-2023)**
 (a) 30 years (b) 42 years
 (c) 60 years (d) 36 years
 (e) 55 years
24. The ratio of P age a years hence to Q age 6 years ago is 5 : 2 and the sum of the present age of P and Q is 58 years. If the age of Q and R after 2a years is 62 years and the present age of R is 24 years, then find the present age of Q. **(IBPS Clerk Prelim-2023)**
 (a) 20 years (b) 22 years
 (c) 24 years (d) 36 years
 (e) Cannot be determined
25. In a class there is $(a + 10)$ number of students whose average weight is 40 kg. If b more students having an average weight is 48 kg is added, then the average weight of the class is increased by 2. If $(b + 5)$ students having an average weight of 44 kg is added then the average weight of the class is increased by 1.6. Find the value of $3(a + b)$? **(IBPS Clerk Mains-2023)**
 (a) 25 (b) 30 (c) 15 (d) 45
 (e) 60
26. Sum of 4 consecutive even numbers is $(x + 12)$ and there are 4 consecutive odd numbers in which 2nd highest number is 37 more than the 2nd lowest even number in the previous series. Sum of Highest number of both series is 105. Find the value of x. **(IBPS Clerk Mains-2023)**
 (a) 124 (b) 120 (c) 112 (d) 116
 (e) 128
27. Ratio of ages of J and K before 6 years was 2:3 then ratio of age of J and K after 10 years becomes 3:4. If age of L is 1.5 times the present age of K, then, find age of L 12 years ago. **(IBPS Clerk Mains-2023)**
 (a) 65 (b) 69 (c) 72 (d) 67
 (e) 70
2. Vaayun got 40% marks in an exam and got 40 marks less than passing marks. Yuvi got 70% marks in that exam and got 20 marks more than passing marks. If Ekansh got 65% marks, then difference of marks between Vaayun and Ekansh is **(RRB Officer Scale-I Prelim-2023)**
 (a) 48 (b) 50 (c) 54 (d) 62
 (e) None of these
3. Out of his monthly salary Rakesh spend x% on rent, $(x+10)$ % on EMI and 36% of the rest on transport and 32% of the monthly salary is saved. Find the value of x? **(RRB Officer Scale-I Mains-2023)**
 (a) 25 (b) 40 (c) 15 (d) 20
 (e) 18
4. The monthly salaries of X and Y together amount to Rs. 40000. X spends 85% of his salary and Y spends 95% of his salary. If now their savings are the same, then the salary of Y is **(RBI Assist. Prelim-2023)**
 (a) Rs. 20,000 (b) Rs. 22,000
 (c) Rs. 26,000 (d) Rs. 30,000
 (e) None of these
5. An empty fuel tank of a car was filled with A type petrol. When the tank was half-empty, it was filled with B type petrol. Again when the tank was half-empty, it was filled with A type petrol. When the tank was half-empty again, it was filled with B type petrol. What is the percentage of A type petrol at present in the tank? **(RBI Asst. Mains-2023)**
 (a) 33.5% (b) 37.5% (c) 40% (d) 50% (e) 45%
6. Sushil scored 103 marks in Hindi, 111 marks in Science, 98 marks in Sanskrit, 110 marks in Maths and 88 marks in English. If the maximum marks of each subject are equal and if Sushil scored 85 percent marks in all the subjects together, find the maximum marks of each subject. **(RBI Asst. Mains-2023)**
 (a) 110 (b) 120 (c) 115 (d) 100
 (e) None of these
7. Ajay scored 750 marks in a exam and suman got 65% marks in the same exam which is 100 marks less than Ajay. If the minimum passing marks in the exam is 50%, then how much more marks did Ajay score than the minimum passing marks? **(IBPS PO Prelim-2023)**
 (a) 180 (b) 190 (c) 250 (d) 196
 (e) None of these

Ratio and Proportion & Mixture Alligation

Percentage

1. In an election, The winner gets 59% of the total votes and wins the election by 2700 votes then find the number of total voters in the election. **(RRB Office Asst. Prelim-2023)**
 (a) 6000 (b) 8000 (c) 10000 (d) 12000
 (e) 15000

1. Kamal started a business with an investment of ₹40,000 and after 6 months Surya joined her investing ₹ 1,00,000. If the Profit at the end of a year is ₹ 27,000 then what is the profit share of Surya? **(SBI Clerk Prelim-2023)**
 (a) ₹ 12,000 (b) ₹ 10,000
 (c) ₹ 15,000 (d) ₹ 11,00
 (e) None of these
2. Ratio of milk and water in a mixture of 54 litres is 5 : 4. 18 litres of the mixture is taken out from the mixture and then 5 litres of water is added to it. Find the final difference between milk and water. **(SBI Clerk Prelim-2023)**

- (a) 2 (b) 4 (c) 3 (d) 1
(e) None of these
3. In a container of capacity 500 ml a mixture of juice and water is kept. Juice is 250 ml and water is 'a' ml, Now 70 ml of mixture is taken out without replacement and the process is repeated one more time, the container is now completely filled by adding water. If the ratio of milk and water in the final mixture is 3 : 7. What is the quantity of water added? **(SBI Clerk Mains-2023)**
(a) 250ml (b) 300ml
(c) 290ml (d) 260ml
(e) 80ml
4. The monthly income of 'A' and 'B' are in the ratio of 1 : 3 respectively. 'A' spends 'x' of his monthly income and saves the remaining ₹12480. The sum of the monthly expenditure of 'A' and 'B' is ₹5920. If the monthly saving and expenditure of 'B' is the ratio of 5:7 respectively then find the average monthly income of 'A' and 'B' together? **(SBI Clerk Mains-2023)**
(a) ₹ 52000 (b) ₹ 54000
(c) ₹ 56000 (d) ₹ 58000
(e) None of these
5. Yuvi and Ekansh started a business with the investment of ₹ 30000 and ₹ 36000 respectively, after 6 months Yuvi withdrawn 20% of his initial investment and Kartik started the business with the investment of ₹ X. At the end of the year, the total profit of the business is ₹ 132000 and profit share of Ekansh is ₹ 48000 and find the vale of X? **(SBI Clerk Mains-2023)**
(a) 72000 (b) 76000
(c) 80000 (d) 64000
(e) None of these
6. P invested Rs. 30000 and Q invested Rs. (30000 + x) in a business. After 4 months Q withdraw 40% of his investment. If the total profit earned at the end of the year is Rs. 9400 and the profit share of Q is Rs. 4400. Find the value of 2x. **(SBI PO Prelim-2023)**
(a) 18000 (b) 6000 (c) 12000 (d) 15000
(e) None of these
7. Vaayun starts business with ₹ 36,000, after 3 months Ekansh join with ₹ 70,000 and after 6 months Yuvi joins with ₹ 81,000. What would be ratio of profit sharing at the end of year? **(RRB Office Asst. Prelim-2023)**
(a) 36 : 70 : 81 (b) 24 : 35 : 27
(c) 72 : 105 : 81 (d) 63 : 54 : 75
(e) 28 : 35 : 54
8. Ayush invested "a" and after 6 months Jay invested (a + 600). The ratio of annual total profit and Ayush's profit is 5 : 2. Find the value of a. **(RRB Office Asst. Prelim-2023)**
(a) 3200 (b) 4500 (c) 5500 (d) 3000
(e) 3600
9. Two friends Paras and Vinit enter into partnership with total inestment of 'X'. If Paras left business after 3 months and at the same time Khali joins with 1000 investment. If ratio of profit share of Paras, Vinit and Khali at end of a year is 3 : 8 : 3, then find the difference between initial investment of Paras and Vinit. **(RRB Office Asst. Main-2023)**
(a) 1000 (b) 1200
(c) 2200 (d) 1800
(e) None of these
10. In 20 L milk, a mixture that contain equal quantity of milk and water is mixed such that quantity of milk becomes 75% of total quantity. Now, 25% of total quantity of this mixture is taken out and replaced by same quantity of water. Find the quantity of water in the final mixture. **(RRB Office Asst. Main-2023)**
(a) 13.5 litres (b) 14.25 litres
(c) 17.5 litres (d) 15 litres
(e) None of these
11. A and B invest ₹ 3,000 and ₹ 4,000 in a business. A receives ₹ 10 per month out of the profit as a remuneration for running the business and the rest of profit is divided in proportion to the investments. If in a year 'A' totally receives ₹ 390, what does B receive? **(RRB Office Asst. Main-2023)**
(a) ₹ 375 (b) ₹ 360 (c) ₹ 350 (d) ₹ 260
(e) None of these
12. In a mixture of Alcohol and water, water is 8 liters. If 5 liters pure Alcohol and 6 liters water is added in the mixture then Alcohol becomes 75% of the mixture. 10 liters of mixture removed from the new mixture. Find the remaining quantity of mixture. **(RRB Officer Scale-I Prelim-2023)**
(a) 50 (b) 46 (c) 48 (d) 52
(e) None of these
13. P and Q started a business with ₹1500 and ₹1800 repectively. R joined after 6 months with ₹ 1400. Profit of R was ₹1400 after 1 year. Find the difference between profit of P and Q. **(RRB Officer Scale-I Prelim-2023)**
(a) ₹ 600 (b) ₹ 720 (c) ₹ 640 (d) ₹ 750
(e) None of these
14. A mixture of 180 it contains $33\frac{1}{3}\%$ water and rest is juice. If 54 litres of mixture is removed and a litre juice is added then the water becomes 25% of the final mixture. Find the value of a. **(RRB Officer Scale-I Prelim-2023)**
(a) 40 (b) 38 (c) 36 (d) 44
(e) None of these
15. The ratio of saving of X and Y is 5 : 3 respectively. The ratio of expenditure of X and Y is 1 : 2 respectively. If the savings of X is 60% of his income then find the ratio of incomes of X and Y respectively. **(RRB Officer Scale-I Prelim-2023)**
(a) 29 : 25 (b) 21 : 23 (c) 25 : 29 (d) 23 : 21
(e) None of these
16. Vaayu and Yuvi invests ₹ (X-1200) and (X+1800) in a business respectively. Investment period of both of them was same. If the total profit is ₹. Y and profit share of Yuvi is $8Y/11$, then find the value of X. **(RRB Officer Scale-I Mains-2023)**

- (a) 3600 (b) 3500 (c) 2800 (d) 2550
(e) 3000
17. Mixture P contains 240 litres of Alcohol and water in the ratio of 8 : 7 respectively. 30 litre mixture is taken out and 30 litre water is added. Now further 60 litre mixture is taken out and 60 litre alcohol is added. This mixture is then added to mixture Q which contains 360 lit of alcohol and water in the ratio of 8 : 7 respectively. Find the final quantity of alcohol in mixture Q. **(RRB Officer Scale-I Mains-2023)**
(a) 332lt (b) 432lt (c) 360lt (d) 336lt
(e) None of these
18. The ratio of investment of M and N is 5 : 6 and that of N and O is 3 : 7. M, N and O invested for 12 months, 10 months, and 10 months respectively. At the end of the year, the profit share of M is Rs. 1740. Find the profit share O? **(RBI Assist. Prelim-2023)**
(a) Rs.4060 (b) Rs.4160
(c) Rs.4260 (d) Rs.4360
(e) None of these
19. Mohit and Rohit decided to invest in a business. They put in their capitals in the ratio of 5 : 3. However, in the next year Mohit invested 40% more money and rohit withdrew 20% of his capital. If at the end of second year Mohit got ₹ 8000 as profit, then find the profit earned by rohit. **(IBPS PO Prelim-2023)**
(a) ₹ 3500 (b) ₹ 3600 (c) ₹ 3050 (d) ₹ 3780
(e) ₹ 3100
20. In a group of four friends P, Q, R and S, Rs. 1,50,000 was divided among them. P took $\frac{2}{3}$ of the money, Q took $\frac{1}{5}$ of the remaining amount, and the rest was divided between R and S in the ratio of 2 : 3 respectively. How much (approx.) did R get as his share? **(IBPS PO Prelim-2023)**
(a) Rs. 15,334 (b) Rs. 15,000
(c) Rs. 16,000 (d) Rs. 17,000
(e) None of these
21. Vessel A contains $3x + 180$ liters mixture of milk and water in the ratio of 5 : 4 and vessel B contains a 630 liters mixture of milk and water in the ratio of 3 : 4. If vessels A and B are mixed together, then the ratio of the milk and water becomes 77 : 76. Find the value of x. **(IBPS PO Prelim-2023)**
(a) 280 (b) 240 (c) 220 (d) 225
(e) 250
22. P starts a business with an investment of ₹ 40,000. After 6 months Q joins with a certain investment. At the end of one year, the profit share of Q is ₹ 10500 out of the total profit of ₹ 24500. Find the investment of Q. **(IBPS Clerk Prelim-2023)**
(a) ₹ 80000 (b) ₹ 50000
(c) ₹ 60000 (d) ₹ 70000
(e) ₹ 75000
23. A sum of Rs. P is distributed among A, B, C and D. A received Rs. 4000 and the amount received by A is 40% of that by D. The ratio of amount received by C and D is 1:4 and B received 60% of the amount received by C. Find the value of P. **(IBPS Clerk Mains-2023)**
(a) 15000 (b) 12000 (c) 24000 (d) 16000
(e) 18000

24. Two persons A and B started a partnership with initial capital of Rs. 20000 and Rs. 30000 respectively and after 4 months B took out 50% of his capital and after 2 more months C joins them with initial capital of Rs. 36000 difference between total annual profit of A and C is Rs. 1800, then total annual profit of A and B together is how much more than annual profit of C alone? **(IBPS Clerk Mains-2023)**
(a) 19832 (b) 18360 (c) 19500 (d) 19800
(e) 18944

Profit and Loss

1. A dealer purchased a washing machine. He allows a discount of 20% on its marked price and gains ₹ 3000. If he allows a discount of 30% on its marked price and gains ₹ 2000. Find the marked price of the machine. **(SBI Clerk Prelim-2023)**
(a) ₹ 7,000 (b) ₹ 9,000
(c) ₹ 12000 (d) ₹ 10,000
(e) ₹ 15,000
2. The ratio of the cost price of two chairs is 5 : 9 one chair, in which cost price is less, is sold at profit of 24% and the other one is sold for Rs. 2196 more than that of the first one, if the overall profit earned after selling both the chairs at 6%. What is the difference of cost price of the two chairs? **(SBI Clerk Mains-2023)**
(a) 3150 (b) 3600 (c) 1800 (d) 2700
(e) None of these
3. The average cost price of two pants M and N is Rs. 800 and the profit percent on these pants are 10% and 20% respectively. If the total selling price of these pants is ₹. 1856, then find the cost price of pant N. **(SBI PO Prelim-2023)**
(a) Rs. 720 (b) Rs. 640 (c) Rs. 960 (d) Rs. 840
(e) None of these
4. Two successive discounts of 25% and D% were given on the marked price of a bag, find the value of D, if the sum of the marked price and the selling price is 4600 and there difference is Rs 1400. **(RRB Office Asst. Prelim-2023)**
(a) 46% (b) 36% (c) 26% (d) 56%
(e) 29%
5. Laxmi bought a refrigerator with 15% discount on the marked price. If she bought it with 20% discount, he would have saved ₹ 200. Find the marked price of the refrigerator. **(RRB Office Asst. Prelim-2023)**
(a) ₹ 4000 (b) ₹ 3000 (c) ₹ 2000 (d) ₹ 5400
(e) ₹ 5600
6. A man sold two steel chairs for ₹ 500 each. On one he gains 20% and on other, he loses 12%. How much does he gain or lose in the whole transaction? **(RRB Office Asst. Main-2023)**
(a) 1.5% gain (b) 2% gain
(c) 1.5% loss (d) 2% loss
(e) None of these
7. A man bought 5 articles A, B, C, D, and E at ₹. 620 each. Selling price of A, B, C, D, and E were x, x + 20, x + 25, x + 75, x + 80 respectively. Overall profit percent by selling all the

- articles was 25%. Find the approximate profit percent by selling article E. **(RRB Officer Scale-I Mains-2023)**
 (a) 45% (b) 33% (c) 20% (d) 25%
 (e) 40%
8. A Shopkeeper marked the price of a smart watch by increasing its production cost by 80%. Now he allows discount of Rs. 160 and gets a profit of Rs. 200 after selling it. The production cost is **(RBI Assist. Prelim-2023)**
 (a) Rs. 320 (b) Rs. 360
 (c) Rs. 575 (d) Rs. 450
 (e) Rs. 580
9. A manufacture undertakes to supply 2000 pieces of a particular component at ₹ 25 per piece. According to his estimates, even if 5% fail to pass the quality tests, then he will make a profit of 25%. However as it turned out, 50% of the components were rejected. What is the loss to the manufacture? **(RBI Asst. Mains-2023)**
 (a) ₹ 12,000 (b) ₹ 13,000
 (c) ₹ 14,000 (d) ₹ 15,000
 (e) None of these
10. A shopkeeper marks up his goods by 20% and then gives a discount of 20%. Besides he cheats both his supplier and customer by 100 grams *i.e.*, he takes 1100 gram from his supplier and sells only 900 grams to his customer. What is his net profit percentage? **(RBI Asst. Mains-2023)**
 (a) 24.5% (b) 17.33% (c) 25% (d) 32.5% (e) 23%
11. Ratio of the cost price of mobile and T. V is 4 : 5. If the shopkeeper sold the mobile at 20% profit and T. V at 30% profit and discount offer of 20% and 35% on Mobile and T. V. respectively, Then what is the ratio of the marked price of Mobile and T. V. ? **(IBPS PO Prelim-2023)**
 (a) 4 : 5 (b) 3 : 5 (c) 6 : 5 (d) 7 : 9
 (e) 7 : 6
12. The selling price of the shirt, when marked up by 40% and then sold at 25% discount is equal to the selling price of the same shirt when marked up by 50% and then sold with a discount of ₹ 180. Find the selling price of the shirt if it is to be sold at 25% profit. **(IBPS Clerk Prelim-2023)**
 (a) ₹ 260 (b) ₹ 520
 (c) ₹ 500 (d) ₹ 650
 (e) None of these
13. A dishonest seller sells his goods at a loss of 10% but the seller uses 750 gram of weight instead of 1 kg weight and obtains a profit of a%. Find the profit % obtained by the seller, if he sells his goods at a profit of a% and uses 750 gram of weight of 1 kg weight. **(IBPS Clerk Mains-2023)**
 (a) 65% (b) 60% (c) 45% (d) 50%
 (e) None of these
- principal in another scheme at the rate of 10% compounded annually for 2 years then find the compound interest earned by him in the second scheme
(SBI Clerk Mains-2023)
 (a) Rs. 8300 (b) Rs. 8600
 (c) Rs. 8200 (d) Rs. 8400
 (e) Rs. 8700
3. Yuvi invested Rs. a in scheme P at a rate of 15% per annum for 2 years at Simple Interest and invested Rs. $(a + 1000)$ in scheme Q at the rate of 12% per annum for 2 years at Interest. If the total interest received by him at the end of 2 years is Rs. 8448 then find the value of a .
(SBI PO Prelim-2023)
 (a) 16,400 (b) 15,200
 (c) 14,400 (d) 15,600
 (e) None of these
4. Shivam invested in scheme A for 4 years at 10% simple rate of interest and amount received from scheme A is re-invested in scheme B for 5 years at 8% simple rate of interest. Difference between total amount received from scheme A and scheme B is ₹ 201.60, then find the total amount invested in scheme B.
(RRB Office Asst. Main-2023)
 (a) 198 (b) 666 (c) 504 (d) 786
 (e) None of these
5. A person invested ₹ a in scheme J at 10% CI for 2 years and ₹ $(a + 500)$ in scheme K at 12% SI for 2 years. The interest obtained in scheme J is 150 less than that in K. Find the amount invested in scheme K.
(RRB Officer Scale-I Prelim-2023)
 (a) ₹ 2000 (b) ₹ 1800 (c) ₹ 1200 (d) ₹ 1500
 (e) None of these
6. ₹ 30000 is invested at 25% SI for 5 years. The amount received from it is invested at 10% CI for 2 years. Find the interest received. **(RRB Officer Scale-I Prelim-2023)**
 (a) ₹ 10775 (b) ₹ 14175
 (c) ₹ 11475 (d) ₹ 12500
 (e) None of these
7. ₹. $(x + 500)$ is invested in scheme P for 5 years at 10% simple interest. The received amount is then invested in another scheme Q offering 10% interest for 2 years at compound interest. Interest received from scheme Q was ₹. 3780. Find the value of X. **(RRB Officer Scale-I Mains-2023)**
 (a) 12500 (b) 12000 (c) 11000 (d) 11500
 (e) 13250
8. Vaayun decided to invest his amount in a ratio of 3 : 2 in two schemes P and Q at a rate of simple interest of 4% and 8 % for 4 years and 2 years respectively. If he gets Rs. 1,200 as SI from both the scheme together, find the amount he invested. **(RBI Assist. Prelim-2023)**
 (a) Rs. 6000 (b) Rs. 6500
 (c) Rs. 7500 (d) Rs. 8500
 (e) Rs. 7000

Simple Interest and Compound Interest

1. A sum is lent at simple interest of 8% p.a. If at the end of three years, the amount received is ₹ 3,720, then find the sum lent. **(SBI Clerk Prelim-2023)**
 (a) ₹ 4000 (b) ₹ 3000 (c) ₹ 5000 (d) ₹ 5600
 (e) ₹ 4400
2. Rohan invested some money in the bank at the rate of 20% compounded annually and after 2 years received interest as Rs. 8800. If the man invested double of the
9. The S.I. accrued on a sum of certain principal in 8 years at the rate of 13% per year is ₹ 6500. What would be the C.I. accrued on that principal at the rate of 8% per year in 2 years?
(RBI Asst. Mains-2023)
 (a) ₹ 1040 (b) ₹ 1020 (c) ₹ 1060 (d) ₹ 1200
 (e) None of these

10. The simple interest accrued on an amount of ₹ 84,000 at the end of three year is ₹ 30,240. What would be the compound interest accrued on the same amount at the same rate in the same period? **(RBI Asst. Mains-2023)**
 (a) ₹ 30,013.95 (b) ₹ 31,013.95
 (c) ₹ 32,013.95 (d) ₹ 33,013.95
 (e) ₹ 34,013.95
11. The interest earned when a sum invested at 15% p. a. simple interest for 4 years is Rs. 600. The same initial sum when invest at $(R + 2)\%$ p.a. compound interest, compounded annually amount to Rs. 1210 at the end of two years. Find the value of R. **(IBPS PO Prelim-2023)**
 (a) 8 (b) 2 (c) 6 (d) 2
12. Sanjay invested ₹ 9000 in compound interest at R% per annum for 2 years and obtained an interest of ₹ 3960. If he invested the same amount in simple interest at $(R - 5)\%$ per annum for 3 years, then find the simple interest received by Sanjay. **(IBPS Clerk Prelim-2023)**
 (a) ₹ 2100 (b) ₹ 3500
 (c) ₹ 4050 (d) ₹ 2025
 (e) None of these
13. A sum of Rs. 'P' is invested for 't' years at 12% simple rate of interest while another sum of Rs. 'P + 1200' is invested for 2 years at 20% annual rate of compound interest such that total interest amount received from both schemes is Rs. 6768. If sum 'P' when invested for 't' years at 10% simple rate of interest gives 3000 as interest, then find the amount received from Rs. (P + 1200). **(IBPS Clerk Mains-2023)**
 (a) 9832 (b) 10368
 (c) 8932 (d) 9560
 (e) None of these

Time and Work/ Pipes and Cisterns

1. A and B can complete a work in 18 days. If A can complete the work in 24 days, then in how many days B alone can complete the work? **(SBI Clerk Prelim-2023)**
 (a) 24 (b) 40 (c) 48 (d) 72
 (e) None of these
2. A, B and C together can do a piece of work in $32\frac{8}{11}$ days. A and Q together can do the same work in 40 days. In how many days will C alone finish the 30% of the work? **(SBI PO Prelim-2023)**
 (a) 51 days (b) 59 days
 (c) 54 days (d) 53 days
 (e) 50 days
3. P and Q can do a piece of work in 20 days. Q and R can do it in 24 days while R and P can do it in 30 days. In how long will they complete it cooperating? **(RRB Office Asst. Prelim-2023)**
 (a) 25 (b) 16 (c) 30 (d) 20
 (e) 24
4. J can complete a work in 42 days. K is 20% more efficient than J. Find the time taken by J and K together to complete the work. **(RRB Office Asst. Prelim-2023)**
 (a) $17\frac{1}{11}$ days (b) $19\frac{1}{11}$ days
 (c) $21\frac{1}{13}$ days (d) $18\frac{3}{13}$ days
 (e) None of these
5. 5 boys can complete a work in 16 days and 8 girls can complete the same work in 36 days. If 10 boys are working for 4 days and the remaining work is done by 48 girls. Find the number of days taken to complete the work. **(RRB Officer Scale-I Prelim-2023)**
 (a) 7 days (b) 9 days
 (c) 4 days (d) 3 days
 (e) None of these
6. P, Q and R complete the work in 25 days and R alone can complete the work in 50 days. If P, Q and R started the work together and after 20 days P and Q left the work, In how many days can R alone complete the remaining work? **(RBI Assist. Prelim-2023)**
 (a) 10 days (b) 15 days
 (c) 18 days (d) 20 days
 (e) 25 days
7. A and B can finish a work in 10 days while B and C can do it in 18 days. A started the work, worked for 5 days, then B worked for 10 days and the remaining work was finished by C in 15 days. In how many days could C alone have finished the whole work? **(RBI Asst. Mains-2023)**
 (a) 30 days (b) 15 days
 (c) 45 days (d) 24 days
 (e) None of these
8. 4 boys and 3 girls finish a job in 6 hours. Also, 5 boys and 7 girls can do the same job in 4 days. If 1 boy and 1 girls will do the same job in x hours, then what will be value of the perfect square nearest to the value of $14x$? **(IBPS PO Prelim-2023)**
 (a) 324 (b) 225 (c) 441 (d) 625
 (e) 729
9. Pipe P can fill a container in 22 minutes, and pipe Q can fill 50% of the container in 14 minutes. Pipe R can empty the container in 14 minutes. If all the pipes are opened at 5 : 00 am, and pipe R is closed after 3 minutes, then at what time (approx) the tank will be filled? **(IBPS PO Prelim-2023)**
 (a) 5 : 00 AM (b) 5 : 15 AM
 (c) 5 : 18 AM (d) 5 : 20 AM
 (e) 5 : 25 AM
10. Male can do "w" work in 60 days and one female can do the same work in 50 days. In how many days 6 male and 5 female together can complete "3w" work? **(IBPS Clerk Prelim-2023)**
 (a) 32 days (b) 12 days (c) 15 days (d) 20 days
 (e) None of these
11. J can complete the work in 20 days. If J started the work and after 4 days, K joined the work, then J and K together complete the remaining work in 8 days, then find the time taken by J and K together to complete the work. **(IBPS Clerk Prelim-2023)**
 (a) 20 days (b) 18 days (c) 24 days (d) 10 days
 (e) 15 days
12. Efficiency of X is 33.33% more than sum of efficiency of Y and Z is 83.33% less than sum of efficiency of X and Y together. If X and Z together can complete 75% of work in 12 days then find in how many days Y can complete 130% of total work. **(IBPS Clerk Mains-2023)**
 (a) 40 (b) 48 (c) 52 (d) 56
 (e) 60

Time, Speed & Distance (Boat & Stream)

- A man can row at the speed of 5 km/hr in still water, and the speed of stream is 3 km/hr. If the time difference between the upstream and downstream journey of the man is 30 minutes, find the distance? **(SBI Clerk Prelim-2023)**
 (a) $\frac{15}{7}$ km (b) $\frac{16}{3}$ km (c) $\frac{4}{3}$ km (d) $\frac{13}{3}$ km
 (e) None of these
- A train moving at a speed of 45 km/hr crosses a standing man in 20 seconds. Find the time taken by it to cross a platform of 200 m. **(SBI Clerk Prelim-2023)**
 (a) 10 s (b) 36 s (c) 12 s (d) 16 s
 (e) 20 s
- A boat travels 1.85 km downstream in 18 hours, while a person can run S km in 24 hours. The speed of the boat in still water exceeds the running speed of the person by 4 km/h, and the speed of the current is 3 km/h. What is the speed of the boat in still water? **(SBI Clerk Mains-2023)**
 (a) 5 (b) 12 (c) 9 (d) 6
 (e) 10
- A train takes t seconds to pass a pole and $t + 12$ seconds to pass a platform. The combined length of the train and the platform is 540 meters and the train's length is L meters. If the train's length is reduced by 30 meters, it then takes 18 seconds to cross a pole. Determine the value of t . **(SBI Clerk Mains-2023)**
 (a) 23.5 (b) 19.7 (c) 16.8 (d) 20.5
 (e) None of these
- Rahul rows a distance of 40 km upstream and 30 km downstream in a total time of $11\frac{1}{2}$ hours. If the speed of the current is 8 km/h, then in how many hours can he row a distance of 128 km upstream? **(SBI PO Prelim-2023)**
 (a) 32 (b) 30 (c) 28 (d) 36
 (e) 40
- There is a boat A, its speed in still water is 8 kmph. It covers distance 'x' in 9 hours in upstream. Now, there is another boat B, whose upstream speed is equal to the downstream speed of boat A. B covers a downstream distance of y km in 1 hour. The speed of B in still water is $(y-4)$ km/h. **(SBI PO Main-2023)**
 Create a relation between y and x .
 (a) $x + 90 = 12y$ (b) $x + 144 = 9y$
 (c) $x + 180 = 12y$ (d) $x + 162 = 9y$
 (e) None of the above
- A train of length $(a + 30)$ meters cross a man moving at the speed of 5 m/s in the opposite direction of the train in 8 seconds and the same train cross a man in 24 seconds if the man is moving in the same direction of a train. Find the speed of the train. **(RRB Office Asst. Prelim-2023)**
 (a) 19 m/s (b) 15 m/s (c) 9 m/s (d) 10 m/s
 (e) 3 m/s
- A train of length 'a + 100' crosses a person running with speed 5 km/h in the same direction in 20 seconds. If speed of train is 50 km/h, then find the time taken by train to cross a platform of length 150 meter. (approx) **(RRB Office Asst. Main-2023)**
 (a) 29 seconds (b) 23 seconds
 (c) 34 seconds (d) 32 seconds
 (e) None of these
- Downstream speed of a boat is 24 km/h while it takes a total of 3.75 hours to cover a certain upstream and comes back to the same point. If the speed of the stream is 4 km/h, then find the time taken by the boat with the speed of the boat in still water to the same distance covered upstream and downstream? **(RRB Office Asst. Main-2023)**
 (a) 3.6 hours (b) 4.2 hours
 (c) 3.2 hours (d) 5 hours
 (e) None of these
- Ratio of speed of V and speed of W is 5 : 12 respectively. V covers X km in 4 hours. and W covers $(X + 80)$ km in 3 hours 20 minutes. Then in what time V covers $(X + 100)$ km if speed of V is increased by 20%? **(RRB Officer Scale-I Prelim-2023)**
 (a) 5.5 hours (b) 7 hours
 (c) 6 hours (d) 7.5 hours
 (e) None of these
- Speed of Boat P is 6 times of the stream, Boat P can cover 105 km upstream in 7 hours, speed of Boat Q in still water is 3 km/hr more than speed of P in downstream, find time taken by Q in minutes to cover same distance in upstream. **(RRB Officer Scale-I Prelim-2023)**
 (a) 280 minutes (b) 240 minutes
 (c) 360 minutes (d) 320 minutes
 (e) None of these
- Time taken by a boat to cover 252 km upstream is 49.99% more than the time taken by the boat to cover 340 km downstream. Total time taken in covering both these distances was 5 hours 35 seconds. Find the approximate distance covered in upstream in 4 hrs 18 sec. **(RRB Officer Scale-I Mains-2023)**
 (a) 252 km (b) 206 km (c) 336 km (d) 272 km
 (e) None of these
- Time taken by a boat to cover 120 km downstream and 180 km upstream is 20 hrs and the time taken by the same boat to cover 60 km upstream is 1 hr more than the time taken by it to cover 72 km downstream. Find the approximate distance covered by the boat in downstream in 6 hrs. **(RRB Officer Scale-I Mains-2023)**
 (a) 95 km (b) 99 km (c) 111 km (d) 119 km
 (e) 109 km
- A train travelling at the speed of 144 km/h crossed a platform 200 m long in 40 seconds. Find the length of the train. **(RBI Assist. Prelim-2023)**
 (a) 1.3 km (b) 1.4 km (c) 1.1 km (d) 1.2 km
 (e) 1.0 km
- Distance covered by Yuvi in 4 hours is 28 km against the stream and with stream 50 km in 2 hours. How much time Yuvi will take to cover 48 km in still water? **(RBI Assist. Prelim-2023)**
 (a) 2 hours (b) 2.5 hours
 (c) 1.5 hours (d) 3 hours
 (e) None of these
- A boat can travel 9.6 km downstream in 36 min. If speed of the water current is 10% of the speed of the boat in downstream. How much time will boat take to travel 38.4 km upstream. **(RBI Asst. Mains-2023)**

- (a) 2 hours (b) 3 hours
(c) 1.25 hours (d) 1.5 hours
(e) 1 hour
17. The total time taken by the boat to go 'x' km upstream and then return back to a certain distance is 10 hours. The ratio of the speed of the boat in still water to the speed of the stream is 4 : 1, respectively. If the upstream distance covered is 100 km more than the downstream distance covered and the boat can cover $(2x + 50)$ km in still water in 15 hours, then find the value of 'x'? **(IBPS PO Prelim-2023)**
(a) 120 km (b) 128 km (c) 100 km (d) 150 km
(e) 158 km
18. Two cars 'A' and 'B' leave from point 'X' towards point 'Y' with car 'A' leaving 2 hours earlier than car B. Both the cars travel first 100 km at 50 km/hr, next 50 km at 25 km/hr and the remaining distance at 20 km/hr. If the distance between X and Y is 250 km, Find the distance between car B half of the distance between points X and Y, when car A reaches point Y? **(IBPS PO Prelim-2023)**
(a) 45 km (b) 60 km (c) 75 km (d) 90 km
(e) 85 km
19. An old man is walking on a foggy road at a speed of x km/hr. Due to low visibility, the old man can see only up to 500 meters. If a car overtakes the man from the behind with the speed of 25 km/hr then the man can see the car for 720 seconds. Find the speed of the man? **(IBPS PO Prelim-2023)**
(a) 22.2 km/hr (b) 22.3 km/hr
(c) 22.4 km/hr (d) 22.5 km/hr
(e) 22.6 km/hr
20. A boat covers 27 km upstream in 3 hours and the boat covers 48 km downstream in 4 hours. Find the ratio of the speed of the boat in still water to the speed of the stream. **(IBPS Clerk Prelim-2023)**
(a) 5 : 2 (b) 7 : 3
(c) 4 : 3 (d) 9 : 5
(e) 7 : 1
21. A train length 240 m crosses 360 m platform in 40 seconds. If the train running at 33.33% less than its usual speed, then find the time taken by the train to cross a pole. **(IBPS Clerk Prelim-2023)**
(a) 29 seconds (b) 24 seconds
(c) 35 seconds (d) 27 seconds
(e) 30 seconds
22. Downstream distance covered by boat A in 't - 5' hours is same as the upstream distance covered by it in 't + 5' hours. If speed of boat A in still water is $96/t$ km/h and speed of stream is 7.5 km/h, then find the downstream distance covered by boat A in 't + 4' hours. **(IBPS Clerk Mains-2023)**
(a) 230 (b) 234
(c) 220 (d) 204
(e) 194
23. A man goes from P to Q and the man covers 1/3rd of the distance by car and 120 km of distance by train of speed 30 km/hr and the remaining distance by bus and the total time taken is 15 hours and the ratio of the speed of car to bus is 5:4. Find the time taken by the man to cover the distance between P and Q using car, if the distance between P and Q is 600 km. **(IBPS Clerk Mains-2023)**

- (a) 8 hrs (b) 16 hrs
(c) 10 hrs (d) 12 hrs
(d) None of these

Mensuration

1. The ratio of the perimeter to the length of a rectangle is 18:5. If the perimeter of the rectangle is 72 cm, then find the ratio of breadth of the rectangle to the perimeter of the rectangle. **(SBI Clerk Prelim-2023)**
(a) 1 : 6 (b) 2 : 9 (c) 3 : 5 (d) 4 : 7
(e) 2 : 5
2. The ratio between the radius of the circle and the length of the rectangle is 7 : 22 and the breadth of the rectangle is equal to the base of the triangle. The area and height of the triangle is 2100 cm^2 and 60 cm. The perimeter of the rectangle is 360 cm, then, find the perimeter of the circle? **(SBI Clerk Mains-2023)**
(a) 220 cm (b) 340 cm (c) 450 cm (d) 550 cm
(e) None of these
3. The length and breadth of a rectangle are in the ratio 3 : 2. If the length is increased by 10 m keeping the breadth same, the new area of rectangle is 6000 m^2 . What is the perimeter of the original rectangle? **(SBI PO Prelim-2023)**
(a) 320 m (b) 300 m (c) 295 m (d) 200 m
(e) None of these
4. A cube has been cut into 8 pieces (all having equal lateral surface area). 9 circles of maximum radius has been drawn on one face of smaller cube. The sum of diameter of 3 circles is 9 unit. Find the value of $1/6^{\text{th}}$ of maximum volume of cylinder that can be fit in the largest cube. **(SBI PO Main-2023)**
(a) 540π (b) 243π (c) 318π (d) 216π
(e) None of the above
5. The circumference of a circle is half of the perimeter of a rectangle. The area of the circle is 2464 m^2 . What is the area of the rectangle, if the breadth of the rectangle is 80 m? **(RRB Office Asst. Prelim-2023)**
(a) 7680 m^2 (b) 7720 m^2
(c) 7560 m^2 (d) 7200 m^2
(e) None of these
6. Diameter of circle inscribed in rectangle is equal to breadth of rectangle. Area of circle is 616 cm^2 . If length of the rectangle is 12 m more than breadth, find the length of rectangle. **(RRB Officer Scale-I Prelim-2023)**
(a) 32 m (b) 36 m
(c) 38 m (d) 40 m
(e) None of these
7. The sum of the perimeter of the rectangle and circle is 138 cm. The ratio between the length of the rectangle and the radius of the circle is 10 : 7. If the breadth of the rectangle is $5/14$ times the radius of the circle. Then, find the area of the circle (in sq. cm)? **(RBI Assist. Prelim-2023)**
(a) 564 (b) 400 (c) 616 (d) 308
(e) 672
8. The ratio of height of a room to its semi-perimeter is 2 : 5. It costs ₹ 260 to paper the walls of the room with paper 50 cm wide at ₹ 2 per metre allowing an area of 15 sq. m for doors and windows. The height of the room is: **(RBI Asst. Mains-2023)**
(a) 2.6 m (b) 3.9 m (c) 4 m (d) 4.2 m
(e) None of these

9. The area of the circle is 1386 cm^2 and the ratio of the breadth of the rectangle to radius of the circle is $4 : 3$. If the circumference of the circle is equal to the perimeter of the rectangle, then what is the area of the rectangle.

(IBPS PO Prelim-2023)

- (a) 1064 cm^2 (b) 1046 cm^2
 (c) 1056 cm^2 (d) 1066 cm^2
 (e) 1076 cm^2

DIRECTIONS (Qs. 10-11): Study the given information carefully and answer the following questions below.

(IBPS PO Mains-2023)

A cube of side A is placed inside a sphere of radius R in such a way that the sphere touches all four vertices of the cube.

Also, a cone of radius $\sqrt{3}R$ and height H has volume $11\frac{11}{14}$ unit.

10. Find the ratio between the total surface area of the sphere to the lateral surface area of the cube.

- (a) $33/16$ (b) $21/22$ (c) $33/14$ (d) $21/23$
 (e) None of the above

11. Determine the relation between A & H .

(a) $\frac{15}{A^4} = H^2$ (b) $\frac{25}{A^4} = H^2$

(c) $\frac{10}{A^4} = H^2$ (d) $\frac{20}{A^4} = H^2$

- (e) None of the above

12. The side of the square is 12 cm less than the sum of the length and the breadth of the rectangle and the breadth of the rectangle is 10 cm . If the perimeter of the square is 18 cm more than that of the rectangle, then find the length of the rectangle.

(IBPS Clerk Prelim-2023)

- (a) 24 cm (b) 18 cm
 (c) 15 cm (d) 20 cm
 (e) 23 cm

Probability, Permutation and Combination

1. A box contains 10 yellow, 8 green and some white balls. Find the probability of getting three different coloured balls when 3 balls are drawn from box at random if total number of balls in the box is 32

(SBI Clerk Mains-2023)

- (a) $1/15$ (b) $3/31$
 (c) $7/31$ (d) $3/17$
 (e) None of these

2. 1 card is randomly chosen from a deck of which red cards have been removed, find the probability that the picked card is a face card.

(IBPS PO Prelim-2023)

- (a) $3/23$ (b) $3/46$
 (c) $6/23$ (d) $3/13$
 (e) None of these

Data Interpretation & Caselets

DIRECTION (Qs. 1-5): Study the following information carefully and answer the questions. (SBI Clerk Prelim-2023)

The below table shows the investment of Deepak and Dinesh in three different stock markets.

Scheme	Amount invested by Dinesh (in ₹)	Amount invested by Deepak (in ₹)
ITC	25,000	40,000
HDFC BANK	20,000	30,000
ICICI BANK	15,000	10,000

1. Find the ratio of the total investment of Deepak in ICICI BANK and ITC together with the total investment of Dinesh in HDFC BANK and ICICI BANK together.

- (a) $10 : 7$ (b) $11 : 8$ (c) $11 : 9$ (d) $13 : 19$
 (e) $11 : 19$

2. If the investment of Gagan in HDFC BANK is 2500 more than the investment of Dinesh in ICICI BANK and the investment of Gagan in ICICI BANK is 3500 less than the investment of Deepak in ITC, then find the average investment of Gagan in HDFC BANK and ICICI BANK.

- (a) ₹29000 (b) ₹28000 (c) ₹26000 (d) ₹27000
 (e) ₹24000

3. The investment of Dinesh in ICICI BANK and HDFC BANK together is what percentage more or less than the investment of Deepak in HDFC BANK and ITC together?

- (a) 50% (b) 100% (c) 150% (d) 200%
 (e) 250%

4. If the investment of Pawan in ICICI BANK is 50% of the investment of Dinesh in HDFC BANK and ITC, then find the total investment of Pawan in ICICI BANK.

- (a) ₹18,500 (b) ₹14,500
 (c) ₹13,500 (d) ₹15,500
 (e) 22,500

5. Find the average of the total investment of Dinesh in HDFC BANK, Deepak in HDFC BANK and Dinesh in ICICI BANK together.

- (a) ₹21666 (b) ₹19566
 (c) ₹17566 (d) ₹23566
 (e) ₹13566

DIRECTIONS (Qs. 6-10): The given table shows the number of Tricycle sold in different shops P, Q, R and S and Cost price of each article, Markup percentage of each article and discount amount of each article in the same shops.

(SBI Clerk Mains-2023)

Shops	Sold Tricycles	Cost price of each Tricycle	Markup % of each Tricycle	Total Discount Amount
P	$(x + 5)$	$4x$	40	210
Q	y	$(y + 5)$	20	$3y$
R	x	$4x$	150	$117x$
S	$(y + 10)$	y	80	$27y$

Note:

- (i) Selling price of Tricycle in shop P is equal to selling price of Tricycle in shop R.
 (ii) Selling price of Tricycle in shop Q is equal to selling price of Tricycle in shop S.
 (iii) The average cost price of Tricycle in each shops P, Q and R is 135.

6. If the cost price of Tricycles in shops S to T are in the ratio 4 : 5 and the number of Tricycles sold in shop T is $(y - 120)$, Markup percentage of Tricycles in shop T is $(x + 5)\%$. If the total discount amount of Tricycles in shop T is Rs. 4800. Find which of the following conditions are true?
- I. Selling price of the Tricycles in shop T is ₹ 265.
 II. Total revenue generated by the shop T by selling all the Tricycles in shop T is ₹ 12500
 III. Number of Tricycles sold in shop T is 70.
- (a) I only (b) II only
 (c) III only (d) I and II only
 (e) I and III only
7. Find the difference between the Sum of the marked price and sum of the selling price of each Tricycles sold in the shop P, Q, R and S.
 (a) ₹ 156.3 (b) ₹ 152.7 (c) ₹ 141.3 (d) ₹ 147.3
 (e) ₹ 149.3
8. If the number of Tricycles sold in the shop Q 20% are defective and sold at Rs. 2 more than the usual discount. Find the total discount amount given by Shop Q by selling all the Tricycles
 (a) 580 (b) 550 (c) 600 (d) 680
 (e) 590
9. If the marked price of each Tricycle in shop R is Rs. _____ and the average number of Tricycle sold in shops R and U is 23 and the total number of Tricycles sold in shop U is _____ then which of the following conditions satisfy the same order.
 (i) 250 and 21 (ii) 250 and 30
 (iii) 250 and 24
 (a) I only (b) III only
 (c) II only (d) I and II only
 (e) None of these
10. If the total number of Tricycles sold in shop P and R together is 55. Find which of the following contexts is true.
 (I) The difference between the total revenue received by the shop P and R is Rs. 665.
 (II) The marked price of each Tricycle in shop R is Rs. 250.
 (III) The selling price of each Tricycle in shop P is Rs. 135.
 (a) I only (b) II only
 (c) I and II only (d) II and III only
 (e) I and III only

DIRECTIONS (Qs. 11-14): Read the following information carefully and answer the questions given below.

(SBI Clerk Mains-2023)

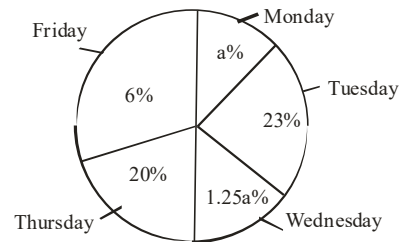
The marked price of an article K and M is 50% above its cost price and the selling price of article J is half of the marked price of article K. The ratio of the marked price of article M and the selling price of article J is 7 : 3. The sum of the marked price of the article L and M is Rs. 810. The profit of article K is Rs. 194 less than the cost price of M. The discount offered on article K is 15%.

11. If the Cost price of the article M is increase by 25% and the discount percentage of the article M is 20% then find which of the following is true in the given following statements?

- I. New cost price of the article M is Rs. 325
 II. Loss of Rs. 13 occurred
 III. Selling price is Rs. 332
 (a) I and II only (b) I only
 (c) II only (d) III only
 (e) I and III only
12. The profit obtained on article L is ₹ 36 and the discount offered on article L is 20%. Find the difference between the selling price of article J and the cost price of article L.
 (a) ₹ 110 (b) ₹ 118
 (c) ₹ 135 (d) ₹ 120
 (e) None of these
13. Selling price of article J to the selling price of article N are in the ratio 3 : 5. The Marked price of article N is ₹ 50 more than its selling price. If the cost price of the article N is Rs. 10 less than the cost price of the article M. If J is sold at 20% profit. Find sum of the cost price of article N. Marked price of article N and Cost price of article J.
 (a) Rs. 750 (b) Rs. 850
 (c) Rs. 900 (d) Rs. 650
 (e) None of these
14. If the profit obtained on article M is Rs. 25 less than the profit obtained on article K, then the discount offered on article M is
 (a) 24.67% (b) 26.89%
 (c) 22.82% (d) 21.25%
 (e) None of these

DIRECTIONS (Qs.15-19): The following pie chart shows the percentage distribution of the number of mobiles sold in a shop in five different days Monday, Tuesday, Wednesday, Thursday and Friday. Total number of mobiles sold = 400

(SBI Clerk Mains-2023)



Note: Difference between number of mobiles sold on Monday and Wednesday is 12.

15. Number of mobiles sold on Tuesday and Monday is what percentage of the number of mobiles sold on all the remaining days.
 (a) 56.87% (b) 50.78% (c) 42.89% (d) 53.84%
 (e) None of these
16. If the cost of each mobiles on Friday is ₹P and cost of each mobiles on Thursday is ₹ (P - 10) if the total cost earned by the shop by selling mobiles on the both the day is ₹ 9200. If the cost of each mobiles on Monday's ₹ (P - 20). Find the total amount earned by the shop on selling mobiles on Monday.
 (a) ₹ 1280 (b) ₹ 1360 (c) ₹ 1440 (d) ₹ 1560
 (e) None of these
17. Number of mobiles sold on Wednesday is 66.667% of the number of mobiles present in the shop on Wednesday initially and the number of mobiles sold on Thursday is

- 33.33% of the number of mobiles present in the shop initially. Find the ratio between the number of unsold mobiles on Wednesday and the number of unsold mobiles in the shop on Thursday (SBI Clerk Mains-2023)
 (a) 2 : 11 (b) 2 : 13 (c) 3 : 16 (d) 3 : 17
 (e) None of these
18. Average number of mobiles sold on Monday and Sunday is 8 less than the number of mobiles sold on Monday and number of mobiles sold to unsold on Sunday are in the ratio 8 : 5. Find the total number of mobiles unsold on Sunday. (SBI Clerk Mains-2023)
 (a) 28 (b) 25 (c) 35 (d) 20
 (e) 44
19. Difference between the mobiles sold on Tuesday and Monday is twice the difference between the number of mobiles sold on Wednesday and Saturday. If the ratio of number of mobiles sold to unsold on Saturday is 19 : 15. Then find the number of mobiles unsold Saturday. (Note: Number of mobiles sold on Wednesday is more than the number of mobiles sold on Saturday). (SBI Clerk Mains-2023)
 (a) 52 (b) 38 (c) 30 (d) 44
 (e) None of these

DIRECTIONS (Qs. 20-25): Read the following directions carefully and answer the following question.

(SBI PO Prelim-2023)

Line graph represents the total number of population visited in Museum P, Q, R and S on Sunday.

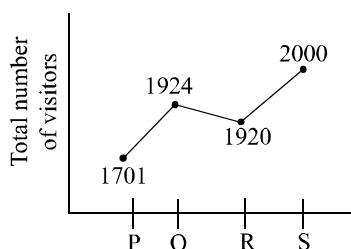


Table represent the number of Bus visited in Park out of total population.

Park	Number of Boys out of total People who visited in Park
P	2/9
Q	11/13
R	13/16
S	19/50

20. If the number of Boys and number in Park T are 7.69% more than the number of Boys who visited in Park R and the number of Girls are 300 less than the number of Boys visited in Park Q. Then find the difference between the number Boys and girls who visited Park T.
 (a) 456 (b) 580 (c) 352 (d) 678
 (e) 876
21. Park P is in village Mangalpura where the number of population was 1,24,000 and the ratio of Boys and girls 15 : 16. Then, find the percentage of total girls on Sunday in Mangalpura village to the total number Boys in Park Q?
 (a) More than 4010%
 (b) Between 3508% to 4040%
 (c) Less than 3886%
 (d) Both option (a) and (c)
 (e) None of these
22. What are the difference between boys who visited Park Q and R together to the average of girls who visited Park P, Q and R together? (approx value)
 (a) 1962 (b) 1700 (c) 1882 (d) 2528
 (e) None of these
23. If the cost price of boy ticket and the girl ticket ₹ X and Rs. (X-5). And the Park Q get the revenue Rs. 94720. Find the total revenue getting from boy ticket from Park P?
 (a) 18900 (b) 20800 (c) 20600 (d) 18700
 (e) None of these
24. Find the average number of visitors in Q, R and S?
 (a) 1176 (b) 2096 (c) 1556 (d) 1948
 (e) None of these
25. The number of population of village Dujar was increased by A% on Sunday due to the number visitors visited at Park T. On Sunday there were total girl 30% of the population on that day and the number of boy population on that day was 4200. Find the girl value of A?
 (a) 200 (b) 150 (c) 300 (d) 100
 (e) None of these

DIRECTIONS (Qs. 26-28): Read the following instruction and answer the following question. (SBI PO Prelim-2023)

Tabular graph shows the number of article sold by shop Urban Nest.

Months	Average of article sold by (P, Q & R)	% of article sold by P out of total	Article sold by R
January	100	20%	160
February	120	25%	70
March	72	50%	65

26. Find the difference between the number of article sold by R sold by Urban Nest in March and January months?
 (a) 86 (b) 55 (c) 95 (d) 42
 (e) 36
27. The price of article sold by Q is Rs. 180 and in the month of March they offer discount of a% and the company will get Rs. 12420. Find the a?
 (a) 40.6 (b) 50.6 (c) 75.6 (d) 60.6
 (e) 42.6
28. If out of the total number of products sold by P March, 25% were returned due to defects, then find the ratio of non defective products sold by P in March and the number of products sold by R in January?
 (a) 84 : 163 (b) 84 : 161
 (c) 83 : 160 (d) 81 : 160
 (e) None of these
29. In January, if person Q sold two types of products i.e. Mobile and Laptop in the ratio of 6:4, then find the difference between the total number of Mobile sold by Q in January and total number of products sold by Q in March. (SBI PO Prelim-2023)
 (a) 6 (b) 5 (c) 8 (d) 4
 (e) None of these

30. Find the average of number of products sold by Q in February and that by R in March? **(SBI PO Prelim-2023)**
 (a) 132.5 (b) 120.5 (c) 118.5 (d) 124.5
 (e) None of these
31. If 1/3rd of the products sold by Q in March were sold to girls then find the product of number of products sold by Q to boys in March and the number of products sold by P in February? **(SBI PO Prelim-2023)**
 (a) 1120 (b) 1080 (c) 2580 (d) 2280
 (e) None of these

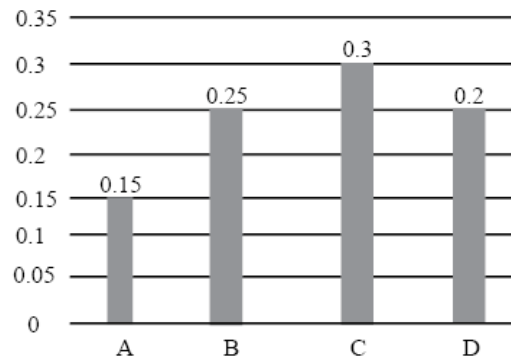
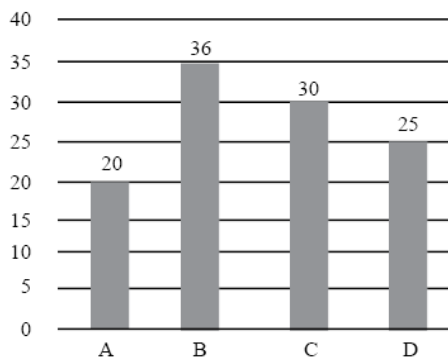
DIRECTIONS (Qs. 32-34): Study the following information carefully and answer the questions given below **(SBI PO Prelim-2023)**

The number of products sold by P in 2020 is 1.5 times of the number of products sold by Q in that year. Number of Products sold by P in 2022 is 14 more than that in 2020. In 2021 P sold 10% less products as compared to 2022. The Ratio of number of products sold by Q in 2020 to that in 2022 is 3:8. Total number of products sold by Q in all the three years is 1 less than the number of products sold by P and Q together in 2022. The number of products sold by Q in 2021 is 1 more than that sold by it in 2020.

32. In 2022, P and Q sold 40% and 64% of their respective products, then find the difference between the number of unsold products of P and Q in 2022. **(SBI PO Prelim-2023)**
 (a) 7 (b) 8 (c) 5 (d) 2
 (e) None of these
33. If the number of products sold by R in 2022 is 25% more than the number of products sold by P in 2020 then find the sum of number of products sold by R in 2022 and that by Q in 2021. **(SBI PO Prelim-2023)**
 (a) 92 (b) 104 (c) 1101 (d) 112
 (e) 70
34. In 2021, if 40% of the number of products sold by P were sold in the total market and rest were transported to outside. Find the total number of products sold by P outside. **(SBI PO Prelim-2023)**
 (a) 27 (b) 30 (c) 35 (d) 25
 (e) None of these

DIRECTIONS (Qs. 35-39): Read the following information and answer the question given below: **(SBI PO Main-2023)**

The first bar graph shows the number of total balls (Red + Blue + Green) in four different bags and the second bar graph shows the probability of picking a red ball from each of bags A and C and probability of picking a green ball from each bags B and D.



35. If the number of blue colour balls in bag A is 2 more than the number of green colour balls in bag B then find the probability of picking two green colour balls from bag A.
 (a) 2/19 (b) 3/38
 (c) 2/38 (d) 4/19
 (e) None of the above
36. If the number of blue colour balls in bag C is equal to the difference between number of green colour balls from bag D and number of blue colour balls in bag A then find the sum of probability of picking 2 green colour balls from bag C and picking a red ball from bag A.
 (a) 5/38 (b) 4/870
 (c) 15/399 (d) 2/380
 (e) Can not be determined
37. If the probability of picking a blue ball from bag A is 0.10, then what is the sum of probability of choosing a green ball from bag B and from bag A?
 (a) 1 (b) 0.8
 (c) 0.95 (d) 0.75
 (e) None of the above
38. If the number of red balls in bag D is a prime number between 7 to 11 (both inclusive), but it is more than the number of green balls in bag B, then find the difference between the probability of picking two red balls from bag D and the probability of picking a red ball from bag A.
 (a) 1/15 (b) 1/30 (c) 1/60 (d) 1/45
 (e) None of the above
39. If the number of blue balls in bag A is a perfect square, then what can be the value of number of green balls in bag A?
 (a) 12 (b) 14 (c) 13 (d) 2
 (e) 5

DIRECTIONS (Qs. 40-44): Read the following information and answer the question given below: **(SBI PO Main-2023)**

Given below is the table of 5 customers visiting a convenience store. Customers are awarded with rewards points according to the purchase made. Rest information is given below.
 Final amount on the bill = Original price – discount
 Per reward point = ₹ 0.5

For members, reward point is given on original price and for non members reward point is given on final amount.

Note: C and E bought 2 articles worth MRP ₹ X and ₹ 2X respectively. Reward points received by C is half of that of E. If C and E were not members of that store, then their reward points would have been half of their earlier reward points respectively. In this case also reward points of C and half of that of E.

	Membership	Reward points	Discount offered
A	No	a	$(a - 10)\%$
B	Yes	$(4a/5) + 3z$	$(z + 10)\%$
C	Yes	$(4a - 5z)$	$(2a/5)\%$
D	Yes	$5z/2$	1150
E	Yes	$2a + 5z$	$(3z/2)\%$

Price Amount Reward Points

< 5000	50
5000-10000	100
> 10000	200

40. If B purchased a shirt and after availing the reward points., amount paid by him is ₹ 6250. then find the original price of the shirt.
(a) ₹ 8100 (b) ₹ 9000 (c) ₹ 10000 (d) ₹ 7500 (e) None of the above
41. Which one of the following cannot be original price of the article bought by D after availing the reward points?
(a) 6075 (b) 5575 (c) 5875 (d) 6875 (e) None of these
42. If E bought a laptop worth MRP of 45000, then what is the final amount paid by him after availing the reward points? (in ₹)
(a) 31400 (b) 31500 (c) 30500 (d) 30450 (e) None of above
43. What is the difference between the discount offered to A and C? (If A bought an article of ₹ 10,000 and C bought on article of ₹ 20,000).
(a) 1000 (b) 2000 (c) 5000 (d) Zero (e) None of these
44. If B bought a laptop worth MRP of ₹ 30,000, then what is the final amount paid by him before availing the reward points?
(a) 20,000 (b) 21,000 (c) 25,000 (d) 27,000 (e) None of these

DIRECTIONS (Qs. 45-49): Read the table carefully and answer the following question. (RRB Office Asst. Prelim-2023)

The table shows the number of items purchased in a stores over a four months.

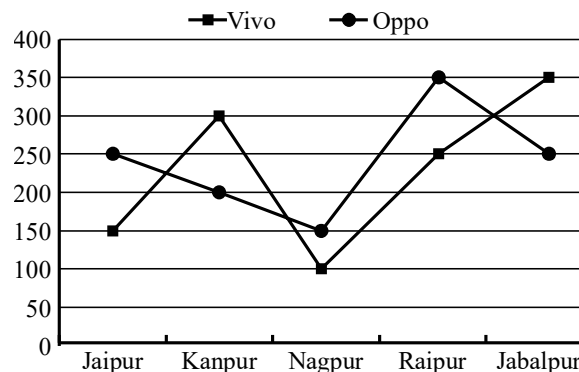
Months	Store		
	Sofa	Chairs	Tables
January	85	45	60
February	70	50	55
March	75	85	50
April	100	65	35

45. Find the difference between the total number of Sofa and the total number of Tables purchased in all the given months.
(a) 100 (b) 110 (c) 120 (d) 130 (e) 140
46. Find the ratio of tables purchased in January and April month together to Chairs purchased in the month February, and March months together.
(a) 17 : 21 (b) 19 : 27 (c) 21 : 17 (d) 27 : 19 (e) 15 : 19

47. If the number of Sofa purchased in month May is $(3/5)$ th of the total number of items in month of April then, the number of Sofa purchased in month March is what percent of the number of Sofa purchased in month May?
(a) 50% (b) 60% (c) 62.5% (d) 70% (e) 30%
48. The total number of items purchased in month of April is how much percent more than that purchased in Month of January?
(a) 5.26% (b) 10.32% (c) 15.41% (d) 20.54% (e) None of these
49. Find the average number of items purchased in each months.
(a) 200 (b) 192 (c) 190 (d) 194 (e) 198

DIRECTIONS (Qs. 50-54): Study the chart and answer the following questions. The line graph show number of vivo and Oppo mobile users in 5 different cities.

(RRB Office Asst. Prelim-2023)



50. Vivo users in Kanpur are how much percentage more than Oppo users in Nagpur?
(a) 50% (b) 150% (c) 100% (d) 1% (e) None of these
51. What is the difference of Vivo users in Raipur and Oppo users in Jabalpur?
(a) 250 (b) 1 (c) 0 (d) 100 (e) 50
52. What is the ratio of Vivo users in Jabalpur to Oppo users in Jaipur
(a) 8 : 5 (b) 5 : 8 (c) 7 : 5 (d) 5 : 7 (e) None of these
53. What is the average of Vivo users in Jabalpur, Kanpur and Raipur?
(a) 900 (b) 300 (c) 600 (d) 200 (e) None of these
54. How many total Oppo users are there in all five cities together?
(a) 1250 (b) 1200 (c) 1150 (d) 1000 (e) None of these

DIRECTIONS (Qs. 55-59): The following table shows the total numbers of tickets (Business + Economy) booked, percentage of Economy tickets booked and number of female economy tickets booked in three different air lines, Akasa, Bipasa and Picasa.

(RRB Office Asst. Main-2023)

Name of airlines	Total number of tickets booked (Business + Economy)	Percentage of Economy tickets booked	Number of female Economy tickets
Akasa	420	33 (1/3)%	30
Bipasa	480	75%	90
Picasa	800	62.5%	100

55. Find the ratio between the number of economy tickets booked in Akasa and Picasa to the number of business tickets booked in Bipasa and Picasa.
 (a) 32:25 (b) 25:21 (c) 32:21 (d) 23:14
 (e) 21:13
56. Number of tickets booked in airline Akasa is 60% of the total tickets and remaining tickets are left vacant. If the number of vacant business tickets is 120 then find the number of vacant economy tickets in airline Akasa.
 (a) 140 (b) 120 (c) 180 (d) 160
 (e) 220
57. If the ticket rates for the airlines Akasa economy and business are ₹ 500 and ₹ 1000 respectively. Find the total revenue generated by booking all the given tickets.
 (a) ₹ 138000 (b) ₹ 40000
 (c) ₹ 350000 (d) ₹ 324000
 (e) ₹ 245000
58. Number of tickets booked by airline Spicejet is 25% more than the number of tickets booked by airline Picasa and the number of economy tickets booked by airline Spicejet is 60% of the total tickets booked. Find the difference between the number of business tickets booked by company Spicejet and company Bipasa.
 (a) 175 (b) 165 (c) 200 (d) 190
 (e) 160
59. If the number of business tickets booked by male in airline Akasa and airline Bipasa is 100 and 50 respectively. Find the difference between the total number of tickets booked by the females in airline Akasa and airline Bipasa.
 (a) 120 (b) 110 (c) 100 (d) 180
 (e) 160

DIRECTIONS (Qs 60-64): The following caselet shows the number of hatchback cars and number of sedan cars sold by the three different manufacturers G, H, and K.

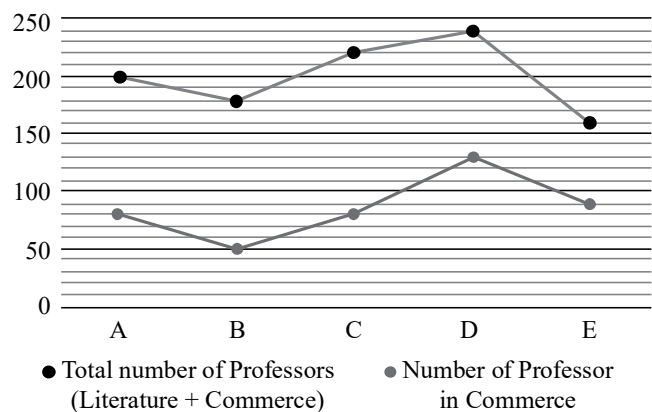
(RRB Office Asst. Main-2023)

Total number of hatchback cars sold by G is 33.33% of the total number of sedan cars sold by H. Total hatchback cars sold by H is 62 more than total sedan cars sold by H. The ratio of total hatchback cars sold by H to K is 2: 1 and the total number of hatchback cars sold by all the three manufacturers is 247. The total number of sedan cars sold by all the three manufacturers is 231.

60. If the ratio between the number of sedan cars sold by G to K are in the ratio 2: 1 and. Find the difference between the 50% of the sedan cars sold by G and the 1/7 th of the sedan cars sold by K.
 (a) 28 (b) 49
 (c) 42 (d) 38
 (e) None of these
61. If the average number of hatchback cars sold by E and G together is 35 and total number of cars (hatchback and sedan) cars sold by E is 80, then find the total number of sedan cars sold by E.

- (a) 28 (b) 34 (c) 21 (d) 42
 (e) None of these
62. Sedan cars sold by H are 60% of the sedan cars sold by F and total number of cars sold by F is 196 then find the ratio between the number of hatchback cars sold by F to the number of hatchback cars sold by G.
 (a) 2: 1 (b) 1:2 (c) 2:3 (d) 3:4
 (e) None of these
63. Find the ratio of total number of hatchback cars sold by G to the average number of sedan cars sold by all the manufacturers respectively.
 (a) 11:4 (b) 4:9 (c) 7:11 (d) 4:11
 (e) None of these
64. If the number of sedan cars sold by the manufacturer H is increased by 2/7 and the number of hatchback cars sold by the manufacturer H is increased by 4, find the difference between the number of sedan cars and hatchback cars sold by H.
 (a) 40 (b) 42 (c) 46 (d) 38
 (e) None of these

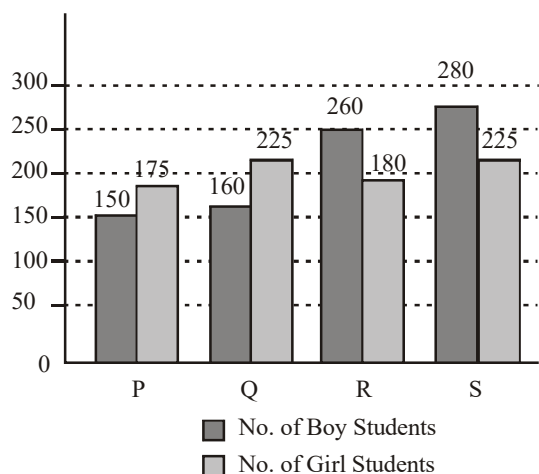
DIRECTIONS (Qs 65-69): The below given line graph shows the total number of professors who teach (Literature + Commerce) and the number of professors who teach Commerce in five different colleges A, B, C, D and E.
 (RRB Office Asst. Main-2023)



65. All the professors in college D who teaches commerce takes 2 hours of class each and all the professors in college D who teaches Literature takes m hours of class. If the total class taken by all the professors in college D is 590 hours. Find the value of m.
 (a) 5 (b) 2 (c) 4 (d) 3
 (e) None of these
66. What is the sum of the average number of commerce professors teaches in all the colleges and the average number of literature professors teaches in all the colleges?
 (a) 139 (b) 200 (c) 275 (d) 238
 (e) None of these
67. Number of professors who teaches literature in college A has increased by 33.3% and the number of professors who teach commerce in college B has decreased by 20%. Find the ratio between increased professors in literature in college A and decreased commerce professors in college B.
 (a) 4: 1 (b) 2:5 (c) 4:3 (d) 3:1
 (e) None of these

68. If $\frac{3}{7}$ th of the professors who teach literature in college C are females and the total number of female professors in college C is 80, find the difference between the number of male professors who teach literature in college C and the number of male professors who teach commerce in college C.
 (a) 34 (b) 22 (c) 28 (d) 17
 (e) None of these
69. Number of professors who teach literature in college D has increased by x and the number of professors who teach commerce in college D has decreased by x . Then the ratio between the number of professors who teach literature to the number of professors who teach commerce in college D is 7 : 5. Find the value of x .
 (a) 22 (b) 35 (c) 30 (d) 25
 (e) None of these

DIRECTIONS (Qs. 70–74): The following bar graph show the number of boy and girl students in four different schools.
 (RRB Officer Scale-I Prelim-2023)



70. The average number of girl students in school P and Q is how much more or less than the average number of boy students in school R and S together?
 (a) 75 (b) 64 (c) 70 (d) 60
 (e) None of these
71. If the number of boy students in school T is 20% more than that in school R and the ratio of number of boy and girl students in school T is 8 : 9, then find the total number of students (boys + girls) in school T.
 (a) 712 (b) 581 (c) 650 (d) 663
 (e) None of these
72. The number of girl students in school S is approximately what percent of number of boy students in school P and Q together?
 (a) 57% (b) 56.25% (c) 72.58% (d) 61.03%
 (e) None of these
73. Find the difference between the total number of boy students and girl students in all school together.
 (a) 65 (b) 45 (c) 70 (d) 50
 (e) None of these
74. If the total number of students in school S is 25% more than that in school T, then find the difference between total number of students in school T and the total number of students in school R.

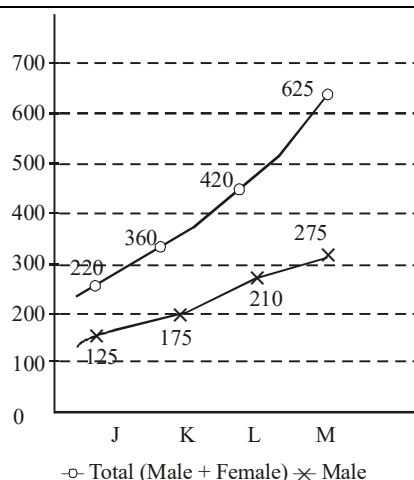
- (a) 50 (b) 45 (c) 42 (d) 36
 (e) None of these

DIRECTIONS (Qs. 75-77): The table given below shows the number of persons (Male + Female) and the number of females in four different colony. (RRB Officer Scale-I Prelim-2023)

Colony	(Male + Female)	Female
P	335	120
Q	420	225
R	360	135
S	425	160

75. Out of the total male in colony P, $\frac{2}{5}$ th are boy and rest are adult, then find the number of adult in colony P is approximately what percent of total number of persons in colony Q.
 (a) 29% (b) 38% (c) 31% (d) 35%
 (e) None of these
76. If the average monthly salary of each male in colony S is ₹ 25000 and monthly salary of each male in colony R is ₹ 20000, then find the difference between the total salary from the male from both the colonies.
 (a) 21.25 lac (b) 24 lac
 (c) 25.2 lac (d) 26.40 lac
 (e) None of these
77. Find the average of number of male is how much more or less than the average of number of female in all the colonies?
 (a) 72 (b) 65 (c) 68 (d) 74
 (e) None of these

DIRECTIONS (Qs. 78 – 82): The line graph shows the total number of male and female patients and number of male patients in four hospitals in a given year.
 (RRB Officer Scale-I Prelim-2023)



78. Out of total number of female patients in hospital K, $\frac{4}{5}$ th are using health insurance and rest are not and out of the total males in hospital K, 40% are using health insurance. Out of the total health insurance users, the ratio of number of patients using LIC insurance and Star health insurance is 54 : 55. Find the number of LIC insurance users in hospital K.
 (a) 98 (b) 115 (c) 108 (d) 121
 (e) None of these
79. If in the next year, the number of males patients increased by 20% in hospital L and in the same hospital the number

of females decreased by 10%, then find the new patient (male + female) in hospital L is how much more or less than the patient of hospital J?

- (a) 178 (b) 221 (c) 309 (d) 156
(e) None of these
80. Find the sum of average number of females patients in hospital M and K together and the average of number of males patients in hospital J and L.
(a) 420 (b) 435 (c) 376 (d) 354
(e) None of these
81. If out of the total number of male patients in hospital M, 30% are in Deluxe room and rest are in sharing room. Out of the total male patients in sharing room 37.5% have health insurance, then the number of male patients in sharing room who do not have health insurance is what percent of total patients of hospital M.
(a) 21.2% (b) 17.4% (c) 18.6% (d) 19.2%
(e) None of these
82. Find the sum of number of male patients in hospital K and L is how much percentage more or less than the number of female patients in hospital J and M together?
(a) 15.62% (b) 14.2% (c) 13.48% (d) 12.5%
(e) None of these

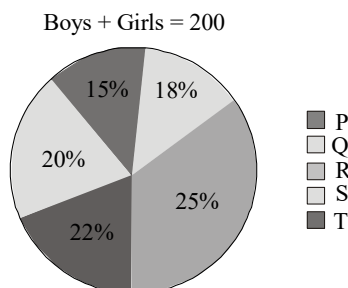
DIRECTIONS (Qs. 83–84): The data is about two products sold by a shopkeeper in three different days. The ratio of number of books sold by the shopkeeper on Monday and Tuesday is 4:5. The number of books sold by the shopkeeper on Tuesday is 261 more than the diaries sold by the shopkeeper on the same day. The number of diaries sold by the shopkeeper on Tuesday is 90% of the number of books sold by it on Wednesday. The ratio of number of diaries sold on Monday and the number of books sold on Wednesday is 5:3. Total number of diaries sold on three days is 539, while no diaries were sold on Wednesday.

(RRB Officer Scale-I Prelim-2023)

83. If the books sold by the shopkeeper on Sunday is $\frac{2}{5}$ th of the books sold by it on Monday, then find the average of number of books sold on Sunday and Wednesday.
(a) 172 (b) 177 (c) 168 (d) 159
(e) None of these
84. Find the number of diaries sold by the shopkeeper on Tuesday is what percent of the number of books sold on Monday.
(a) 48% (b) 50.4% (c) 52.5% (d) 54%
(e) None of these

DIRECTIONS (Qs. 85-90): The pie chart given shows the percentage distribution of number of students (Boys + Girls) in five different B.ed colleges and the table given below shows the % of boys in each college out of total number of boys in all the colleges i.e. 80.

(RRB Officer Scale-I Mains-2023)



Colleges	% of boys
P	30%
Q	10%
R	20%
S	25%
T	15%

85. In College P, if total number of students studying in B.A is 50% of the total students in that college and rest are in B.Sc. Out of the total students studying in B.A, $\frac{1}{3}$ rd are girls, then find the number of boys studying in B.Sc.
(a) 10 (b) 12 (c) 18 (d) 16
(e) None of these
86. If out of the total number of boys in college R, $\frac{1}{4}$ th are from city A and rest are from city B and X of girls from college C are from city B and rest are from city A. If total number of students from college R who are from city A is 18.18% of the total students in that college, then find the value of X.
(a) 71.42% (b) 85.71% (c) 56.25% (d) 57.14%
(e) 61.16%
87. If the monthly fees of a boy in college S is ₹.2000 which is 25% more than that of a girl in the same college, then find the total monthly fees of all the girls in college S.
(a) 35000 (b) 34000 (c) 38000 (d) 32000
(e) None of these
88. If the ratio of number of girls in college Q and U is 6:11 and out of the total girls in college U, 28.56% have opted for B.Com, then find the difference between the number of girl in college U who do not opted for B.com and the number of students in college T.
(a) 30 (b) 25 (c) 20 (d) 35
(e) None of these
89. If 20% boys and 25% of the girls from college S, travel by bus and the rest travel by family car, then find the ratio of number of students from college S, who travel by family car and the number of students from college P.
(a) 45 : 41 (b) 36 : 31 (c) 41 : 45 (d) 31 : 36
(e) None of these
90. Find the average of number of girls in all the colleges together except P and T.
(a) 25 (b) 22 (c) 32 (d) 30
(e) None of these

DIRECTIONS (Qs. 91-96): The table given below shows the number of bikes manufactured by 4 different companies and the number of bikes sold and the unsold number of bikes by each company.

(RRB Officer Scale-I Mains-2023)

Note: 1. Average of number of bikes manufactured by L and M is 985.

2. The number of Bikes sold by L is 50% of that by M.

Companies	Manufactured bikes	Sold	Unsold
J	1620	x	b
K	1.65x	a+b	506
L	810	...	3.3a
M	...	c	200

91. Find the ratio of number of bikes unsold by company L and M.

- (a) 20 : 31 (b) 20 : 33 (c) 30 : 23 (d) 33 : 20
(e) None of these
92. If out of the total unsold bikes of company, J, 45% are TVS and rest are Hero, then find the unsold Hero are what percent of the total manufactured bikes by company J?
(a) 15.51% (b) 38.91% (c) 26.48% (d) 18.80%
(e) None of these
93. If the ratio of number of sold bikes of company K and N is 11:12, and 40% of the manufactured bikes by company N were sold, find the sum of total unsold bikes of company N and M.
(a) 1560 (b) 1450 (c) 1640 (d) 1480
(e) None of these
94. If company P manufactured 8a bikes out of which 0.5b bikes are unsold, then find the average of number of sold bikes of company P and J.
(a) 625 (b) 825 (c) 515 (d) 745
(e) None of these
95. If the unsold bikes of company L are transferred to a third party for selling and the third party was able to sell only $\frac{2}{6}$ th of the bikes, then find the number of bikes still unsold of company L.
(a) 330 (b) 240 (c) 220 (d) 280
(e) None of these
96. If the difference between the number of bikes manufactured by company K and O is x and company K manufactured more bikes than O and company O sold 33.33% of their bikes, then find the number of unsold bikes of company O.
(a) 364 (b) 268 (c) 324 (d) 296
(e) None of these

DIRECTIONS (Qs. 97-100): Study the following information carefully and answer the given questions.

(RRB Officer Scale-I Mains-2023)

There are three shops P, Q and R. All the shops are selling furniture. The number of tables sold by shop P is 33.33% less than the number of chairs sold by it. The cost of a table and a chair of shop P is ₹. 240 and ₹.200 respectively. The number of tables sold by shop Q is 5 more than that by P. The number of chairs sold by shop Q is 80. The cost of a table and a chair of shop Q is ₹. 260 and ₹. 210 respectively. The number of tables sold by shop R is 150. The number of tables sold by shop Q is 16.66% less than that by shop R. The total number of furniture sold by shop R is 270. The cost of a table of shop R is 50% more than that of Q.

Note: Total furniture = Tables + Chairs

97. Find the difference between total cost of all the tables of shop P and the total cost of all the chairs of shop R.
(a) 1250 (b) 1440 (c) 1560 (d) 1380
(e) 1620
98. If the number of tables sold by shop S is average of number of tables sold by P and R and the number of chairs sold by S is $\frac{1}{3}$ rd more than the number of tables sold by it, then find the ratio of number of Chairs sold by Q and S.
(a) 5 : 9 (b) 3 : 5 (c) 5 : 7 (d) 4 : 9
(e) None of these
99. If the number of tables sold by shop Q is 20% of the manufactured tables by the shop, then find the number of unsold tables of shop Q.
(a) 500 (b) 475 (c) 525 (d) 625
(e) None of these

100. If the ratio of number of chairs sold by shop R and T is 4 : 7 and the cost of a chair of shop T is 40% more than that of shop Q, then find the total cost of all the chairs of shop T.
(a) ₹. 60520 (b) ₹. 59780
(c) ₹. 52650 (d) ₹. 61740
(e) None of these

DIRECTIONS (Qs. 101-103): Read the following comprehension and answer accordingly
(RBI Assist. Prelim-2023)

There are three watch-selling companies, P, Q, and R. Each of these companies sells both analog and digital watches. Company R sold 192 digital watches. Analog watches make up 60% of its total watch sales of Company R. The total sales of P, Q and R is in the ratio 7 : 9 : 6. Company P sells digital and analog watches in a ratio of 5 : 3. The sum of the analog and digital watch sales of Company R equals the number of analog watches sold by Company Q.

101. Find out the exact number of analog watches sold by Company Q?
(a) 500 (b) 560 (c) 360 (d) 480
(e) 400
102. What percentage of Company P's total watch sales were analog watches?
(a) 55.2% (b) 37.5% (c) 62.5% (d) 45.8%
(e) None of these
103. Calculate the total number of analog watches sold across all three companies?
(a) 758 (b) 876 (c) 978 (d) 954
(e) 832

DIRECTIONS(Qs.104-108): Study the table and answer the questions given below: **(RBI Assist. Prelim-2023)**

Number of Jan Dhan accounts opened (in thousands) in four Banks in various months.

Month Bank	May	June	July	August
SBI	25	28	35	65
PNB	22	18	32	30
BOB	30	45	50	35
UCO	35	42	45	50

104. In which of the following months is the average of the number of opened accounts the maximum?
(a) June (b) July (c) August (d) May
(e) Both (a) and (b)
105. The number of accounts opened in August is approximately what percent more or less than the number of accounts opened in June?
(a) 33.5 (b) 35.3 (c) 34.6 (d) 40
(e) 45
106. In which Bank is the average number of accounts opened the maximum?
(a) SBI (b) PNB
(c) UCO (d) BOB
(e) Both (b) and (c)
107. The average number of accounts opened in UCO is approximate what percent more or less than the average number of accounts opened in PNB?
(a) 68.62 (b) 60 (c) 45.90 (d) 50.69
(e) 61

108. Find the total number of accounts opened in May
 (a) 110000 (b) 112000 (c) 125000 (d) 120000
 (e) None of these

DIRECTIONS (Qs. 109 - 113) : Study the following table carefully and answer the questions given below:

(RBI Asst. Mains-2023)

Number of students in five disciplines of a college over the years

Discipline Year	Arts	Sci.	Com.	Manag.	Agri.
2001	240	358	275	215	314
2002	260	390	286	234	365
2003	275	374	265	269	336
2004	284	368	290	255	348
2005	296	415	272	284	326
2006	312	432	364	276	383

109. In which year was the percentage change in case of the agriculture discipline highest compared to the previous year?
 (a) 2002 (b) 2003 (c) 2004 (d) 2005
 (e) 2006
110. How much approximate percentage increase was there in the number of students of commerce discipline from 2003 to 2004?
 (a) 14% (b) 18% (c) 20% (d) 9%
 (e) 22%
111. In which year was the difference in number of students of arts and science exactly 130 ?
 (a) 2001 (b) 2002 (c) 2004 (d) 2006
 (e) None of these
112. The total number of students in agriculture in 2001 and 2005 together was approximately what percent of the number of students of the same discipline in 2002 ?
 (a) 75% (b) 165% (c) 65% (d) 175%
 (e) 190%
113. In which discipline was there a continuous increase in the number of students over the given years?
 (a) Science (b) Agriculture
 (c) Arts (d) Commerce
 (e) Management

DIRECTIONS (Qs. 114-118) : Study the following information carefully to answer these questions. **(RBI Asst. Mains-2023)**

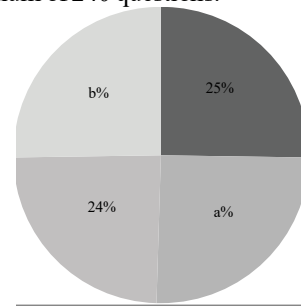
An Institute having 450 employees has sent all its employees for training in one or more areas out of HRM, Computer Skills and Financial Skills. Employees are classified into two categories officers and clerks, which are in the ratio of 4:5 respectively. 10% of the officers take training only in Computer Skills, 16% of the clerks take training only in HRM which is equal to the number of officers taking training only in Financial Skills and 50% of the number of officers taking training in HRM and financial Skills both. 6% of the total employees take training in all three of which two-third are officers. 10% of the total employees take training in HRM and Computer Skills both, which is five times

the number of clerks taking training in Computer Skills and Financial Skills. 10% of the clerks take training in HRM and Computer Skills both. Number of officers taking training only in HRM is 25% of the number of clerks taking training only in HRM. 20% of the total number of employees take training only in Computer Skills. Number of clerks taking training in HRM and Financial skills both is 20% of the total number of clerks.

114. Total how many officers take training in HRM?
 (a) 110 (b) 128 (c) 118 (d) 98
 (e) None of these
115. Total how many clerks take training in Computer Skills but not in HRM?
 (a) 113 (b) 104 (c) 88 (d) 79
 (e) None of these
116. Total how many employees take training in Financial Skills but not in HRM?
 (a) 106 (b) 135 (c) 127 (d) 134
 (e) None of these
117. Total how many clerks take training in Financial Skills?
 (a) 115 (b) 106 (c) 47 (d) 97
 (e) None of these
118. What percent of the total number of officers take training in Computer Skills but not in Financial Skills?
 (a) 25% (b) 40%
 (c) 20% (d) 15%
 (e) None of these

DIRECTIONS (Qs. 119-121): The pie chart given below shows the percentage distribution of total number of questions attempted by 4 students. **(IBPS PO Mains-2023)**

In an exam there are three subjects Hindi, Social Science, and Science. Number of total questions in Hindi, Social Science and Science papers are 120, 60 and 100 respectively. A student can attempt a maximum of 240 questions.



Total number of questions = 800

119. Find the value of a-b.
 I: Q has attempted highest number of questions and S has attempted lowest number of questions and difference between number of questions attempted by P and S is 40
 II: Q attempted more than 200 questions and S attempted less than 190 questions.
 (a) Only I alone (b) Only II alone
 (c) Either I or II alone (d) Both together
 (e) Neither I nor II together
120. R attempted 54 questions in Social Science, Find possible number of Hindi questions attempted by R, if number of Science question attempted by R is higher than that in Social Science but lower than that in Hindi.
 (a) 85 (b) 83 (c) 86 (d) 87
 (e) None of these

121. If each wrong question carries –1 mark and each right question carries 2 marks, then, find the number of incorrect questions attempted by P in Social Science if it is given that out of the total questions attempted by P, 30% are of Social Science and marks obtained in Social Science by her is 66.
- (a) 18 (b) 22 (c) 20 (d) 24
(e) None of the above

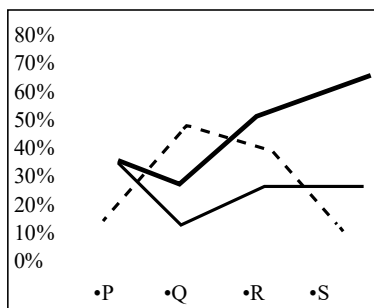
DIRECTIONS (Qs. 122-125): Study the given information carefully and answer the following questions below.

(IBPS PO Mains-2023)

There are four restaurants P, Q, R, S. In each restaurant, customers are paying their bills through Debit card or cash only. A lucky draw allows them some discount as follows:

- Some debit card users get 10% cashback.
- Some cash payment users get 2% cashback.

The line graph shows the % of people using debit card to pay the bill, % of people getting 10% cashback using debit card, % of people getting 2% cashback using cash payment.



— % of people using debit card
 - - - % of people getting 10% cashback using debit card
 % of people getting 2% cashback using cash payment

122. If on 20th September, 2023, In restaurant P, If 210 customers are using debit card but not getting cashback, then find the number of people getting cashback in restaurant P?
 (a) 320 (b) 336 (c) 324 (d) 340
 (e) None of the above
123. In restaurant Q, there are 800 customers. As per new festive scheme, if the average cashback for cash users only who do not get 2% cash back offer is Rs. 200 per person, then find the total revenue returned to them.
 (a) Rs. 37600 (b) Rs. 38400
 (c) Rs. 29000 (d) Rs. 98000
 (e) None of the above
124. In restaurant Q, there are total 2000 customers. Find the number of customers who are getting 10% cashback is how much percent more or less than the number of customers who are using cash payment?
 (a) 60% (b) 80% (c) 75% (d) 62.5%
 (e) 25%
125. In restaurant R, there are total 2400 customers. Find the difference between the number of customers who are getting 10% cashback and the number of customers who are using cash payment.
 (a) 360 (b) 342
 (c) 384 (d) 396
 (e) None of the above

DIRECTIONS (Qs. 126-129): Study the given information carefully and answer the following questions below.

(IBPS PO Mains-2023)

The table shows data about distance (km) about one point to another point by the vehicles used in each point and the speed of each vehicle (km/hr).

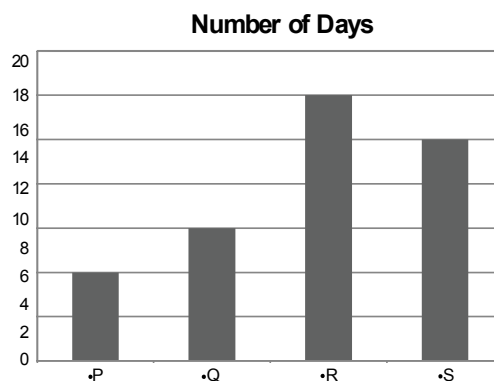
Example : If one person wants to travel from P to S then he/she can only use the vehicle available at point P or vice versa. X means there is no direct connection between points.

	P	Q	R	S	Transport vehicle	Speed
P	0	120	X	260	Train	40
Q	180	0	X	200	Auto	25
R	140	240	0	X	E-Rickshaw	30
S	320	X	420	0	Cycle	12

126. If one person travels from P to Q and another person travels from S to R, then find the difference between distance travelled by them.
 (a) 280km (b) 300km (c) 340km (d) 320km
 (e) None of the above
127. If one person wants to travel from P to R, then find the minimum time required to cover this distance.
 (a) 55 hrs (b) 45.5 hrs (c) 36 hrs (d) 41.5 hrs
 (e) 30.5 hrs
128. If a person travels P to S via Q and the fair of vehicle per km from point Q is 20% more than that from point P, and the total fare to cover from P to S via Q is Rs. 37800, then find the per km cost of Auto.
 (a) ₹ 120 (b) ₹ 100 (c) ₹ 105 (d) ₹ 126
 (e) None of the above
129. Find the minimum possible sum of time taken to cover distances from P to S and from R to S.
 (a) 43/3 hrs (b) 53/3 hrs
 (c) 40/3 hrs (d) 10 hrs
 (e) None of the above

DIRECTIONS (Qs. 130-133): Following bar graph shows working efficiency of four people to complete the work.

(IBPS PO Mains-2023)



130. P and Q starts working together and after 2 days, both of them left the work. Then in how many days the remaining work will be completed by S?

- (a) 13/6 days (b) 41/5 days
 (c) 44/5 days (d) 47/5 days
 (e) 49/5 days
131. In how many days the total work will be completed, if all the four persons starts working together?
 (a) 720/247 days (b) 947/734 days
 (c) 780/249 days (d) 698/233 days
 (e) 587/144 days
132. If S and P starts working together and after 2 days, they both left the work and Q alone works on third day, then find the remaining portion of the work after 3 days.
 (a) 1/10 (b) 21/40 (c) 1/12 (d) 11/25
 (e) 2/5
133. If at the place of Q, T joins the work with P, R and S, then work will be completed in 48/13 days. Working efficiency of T is-
 (a) 12 (b) 30 (c) 27 (d) 36

DIRECTIONS (Qs. 134-138): Read the following information carefully and answer the questions given below.
(IBPS Clerk Prelim-2023)

The given table chart shows the number of mobiles sold in 2021 and 2022 by four different shops namely P, Q, R and S.

Company	Number of mobiles sold in 2021	Number of mobiles sold in 2022
P	540	900
Q	840	640
R	600	800
S	960	870

134. If the average number of mobiles sold by shops R, S and T in 2021 is 800, then find the number of mobiles sold by shop T in 2021.
 (a) 720 (b) 760 (c) 900 (d) 840
 (e) None of these
135. Find the ratio of the number of mobiles sold by shop R in 2021 to the number of mobiles sold by shop S in 2022.
 (a) 20:29 (b) 13:15 (c) 18:17 (d) 17:19
 (e) None of these
136. Find the difference between the number of mobiles sold by shop P and Q together in 2021 and the number of mobiles sold by shop R and S together in 2022.
 (a) 320 (b) 290 (c) 220 (d) 170
 (e) None of these
137. Out of the total number of mobiles sold by shops S in 2021, 30% of the mobiles sold were of A brand and the remaining mobiles were of B brand. Find the difference between the number of A and B brand mobiles sold by shop S in 2021.
 (a) 328 (b) 384 (c) 360 (d) 352
 (e) None of these
138. The number of mobiles sold by shop Q and R together in 2021 is what percentage of the number of mobiles sold by shop R in 2022?
 (a) 125% (b) 150% (c) 180% (d) 100%
 (e) None of these

DIRECTIONS (139-143): Study the following line chart carefully and answer the questions given beside.
(IBPS Clerk Mains-2023)

The table given below shows the data about number of articles (Professional + Traditional) purchased by Ekansh and Vaayan together in three different years.

Note: Traditional items purchased by Ekansh and Vaayan together in 2021, 2022, 2023 is 38, 88 and 114 respectively.

Years	Total Items (Professional)	Ekansh		Vaayan		Professional + Traditional items GIpurchased by Vaayan
		Professional	Traditional	Professional	Traditional	
2021	100	.....	2P	3P	.....	50
2022	150	.....	3P	.....	.....	70
2023	231	a	5P	.....	b	99

139. Find which one is true.
 I. $b = 75\%$ of a II. $a = 6P$ III. $b = 2P + 28$
 (a) Only I (b) Only II and III
 (c) Only I and III (d) I and II
140. Out of the total professional items purchased by Vaayan in 2022, Graphics and Metaphors was purchased in the ratio 5:4. If only 20% of the Graphics items were used by him in that year then find the difference between the number of unused graphics items in 2022 by Vaayan and the number of traditional items purchased by Ekansh in 2023.
 (a) 64 (b) 56 (c) 52 (d) 48
 (e) None of these
141. If number of professional items purchased by Ekansh in 2024 is 50% more than that purchased by him in 2022 then find the number of professional items sold by Ekansh in 2024 is what percent of total traditional items purchased by Vaayan in 2021 and 2023 together?
 (a) 98.50% (b) 97.05%
 (c) 95.25% (d) 94%
 (e) None of these
142. If out of the total traditional items purchased by Ekansh in 2023, 30% are used in household and rest are used as gifts, out of the total gifts items the ratio of number of gifts given to male and female is 3:4, then find the number of traditional gift items given to females by Ekansh in 2023.
 (a) 36 (b) 32 (c) 28 (d) 24
 (e) None of these
143. Find the difference between the average of traditional items purchased by Vaayan in all the years and average of Professional items purchased by Ekansh in all the years together.
 (a) $\frac{24}{3}$ (b) $\frac{22}{3}$ (c) 7 (d) $\frac{29}{3}$
 (e) None of these

DIRECTIONS (144-148): Study the following information carefully to answer the questions that follow:
(IBPS Clerk Mains-2023)

There are three sports club P,Q and R. The number of athletes in club Q in 2012 and 2020 is 4b and C respectively. The ratio of number of athletes in club Q in 2012 and 2016 is 4:5 respectively. The number of athletes in club P in 2016 is 6 more than that in Q in 2016. The number of athletes in club R in 2012 is 2C and in 2016 is 42 more than that in 2012. The ratio of number of athletes in club R in 2016 and 2020 is 16 : 15 respectively. The total

number of athletes in club Q in all the three years together is 300 and that in R is 522. The total number of athletes in club P in 2012 is 16 more than the number of athletes in club R in the same year.

144. Find the difference between the number of athletes in club P in 2016 and the number of athletes in club R in 2012 and 2020 together.
 (a) 202 (b) 199 (c) 194 (d) 207
 (e) None of these
145. If 37.5% of the athletes in club R in 2016 have been selected for national levels and of the national level athletes selected from club R in 2016, $\frac{1}{4}$ th got rejected before the final round, then the number of athletes who got selected for national level final round in 2016 is what percent of the number of athletes in club Q in 2012?
 (a) 49% (b) 50% (c) 60% (d) 54%
 (e) 52%
146. Find the average of number of athletes in club P in 2012, club Q in 2020 and club R in 2016.
 (a) 144.33 (b) 142.67 (c) 143 (d) 141.27
 (e) None of these
147. Out of the total number of athletes in 2020 in club R, 45% have opted for coaches. Then find the sum of number of athletes in club R in 2020 who do not opted for coaches and the number of athletes in 2016 in club Q.
 (a) 216 (b) 219 (c) 224 (d) 208
 (e) None of these
148. If the number of athletes in 2020 in club S is same as the difference between number of athletes in club P in 2016 and club Q in 2020, then find the difference between the number of athletes in club R in 2012 and the number of athletes in club S in 2020.
 (a) 92 (b) 94 (c) 90 (d) 88
 (e) None of these

DIRECTIONS (Qs. 149-153): Answer the questions based on the information given below. **(RBI Grade B-2023)**

A survey was conducted among certain number of players who played games in at-least one of the levels i.e. Domestic and Global. Players who played only at Domestic level played in at least one of the three trophies i.e. ICC World Cup, Ashes and Vijay Hazare while the players who played only at Global level played in at least one of the two leagues i.e. IPL and GT20.

Out of total number of players, 10% had played at both levels and the number of players who played only at Domestic level is 250 more than number of players who played only at Global level. 24% of players who played only at Domestic level had played only ICC World Cup which was 200 less than players who played only in IPL. Number of players who played in all three trophies i.e. ICC World Cup Ashes and Vijay Hazare is 144 and is 52% less than number of players who played only ICC World Cup. Ratio of number of players who played only in GT20 to number of players who played in both ICC World Cup and Vijay Hazare but not in Ashes is 25: (p + 3). Number of people who played only at Domestic level but not played Vijay Hazare trophy is 630. $(2p - 0.8)$ % of number of players who played only at Domestic level had played only in Irani trophy. The number of players who played only at Global level and played only in IPL was $(p + 10)$ % of total number of players. $(2p + 1.6)$ % of players who played at Domestic level had played in both ICC World Cup and Ashes trophy. Number of players who

played both ICC World Cup and Ashes but not Vijay Hazare trophy was 125% more than number of players who played both Vijay Hazare and Ashes but not Ranji.

149. Number of players who played exactly in one trophy is:
 (a) 650 (b) 620 (c) 690 (d) 720
 (e) 740
150. Number of players who played only in GT20 is how much percent of total number of players who played at the Global level?
 (a) 40% (b) 30% (c) 24% (d) 50%
 (e) 45%
151. Ratio of number of players who played in both ICC World Cup and Vijay Hazare trophy but not in Ashes trophy to number of players who played in both Vijay Hazare and Ashes trophy but not in ICC World Cup trophy is:
 (a) 10:9 (b) 15:14
 (c) 29:20 (d) 39:20
 (e) None of these
152. Total number of players who played in IPL is:
 (a) 300 (b) 500 (c) 700 (d) 750
 (e) 450
153. Difference between number of players who played in all three trophies and number of players who played in both leagues is:
 (a) $6p - 6$ (b) $5p - 6$
 (c) $3p^2 - 25p + 6$ (d) $5p^2 - 45p + 12$
 (e) None of these

Data Sufficiency & Data Analysis

1. In the given question, two quantities are given, one as Quantity I and another as Quantity II. You have to determine relationship between two quantities and choose the appropriate option. **(SBI Clerk Mains-2023)**
 Umesh bought two articles A at Rs. x and article B at ₹ x + 50. He sold article A at 20% profit and article B at 10% loss, and earned Rs. 45 as profit on the whole deal.
Quantity I : Profit earned by Umesh on selling Article A (in Rs.)
Quantity II : Loss incurred (in ₹) when an article which costs Rs. 560 is sold at 25% loss.
 (a) If Quantity I \geq Quantity II
 (b) If Quantity I $>$ Quantity II
 (c) If Quantity I $<$ Quantity II
 (d) Quantity I = Quantity II or the relationship cannot be established from the information that is given
 (e) Quantity I \leq Quantity II

DIRECTIONS (Qs. 2-5): In the question, two quantities (I) and (II) are given. You have to solve both quantities to establish the correct relation between Quantity (I) and Quantity (II) and choose the correct option. **(SBI Clerk Mains-2023)**

2. **Quantity I:** $50x + 3^2 \times \sqrt[3]{64}$ such that $2 \leq x \leq 4$

Quantity II: $\sqrt[3]{216y^3} - 2y^4 + 50y$ such that $8 \leq y \leq 10$

- (a) Quantity (I) $>$ Quantity (II)
 (b) Quantity (I) $<$ Quantity (II)
 (c) Quantity (I) \geq Quantity (II)
 (d) Quantity (I) \leq Quantity (II)
 (e) Quantity (I) = Quantity (II) or No relation can be established

3. **Quantity I:** Pipe P can fill a tank in 3 hours. Pipe Q can fill the same in 4 hours while Pipe R can fill the same tank in 5 hours. What is the time taken when all of them works together?

Quantity II: Two pipes P and Q can fill a tank in 8 hours. While Pipe Q and Pipe R can fill the same in 10 hours. Pipe R and Pipe S fill the tank in 15 hours. Pipe P and Pipe S can fill the same tank in 30 hours. Find the time taken by them to fill the tank together.

- (a) Quantity I > Quantity II
- (b) Quantity I < Quantity II
- (c) Quantity I = Quantity II or no relation can be established
- (d) Quantity I ≤ Quantity II
- (e) Quantity I ≥ Quantity II

4. **Quantity I :** Perimeter of triangle cut, of a square of side 22 cm, four isosceles triangles are cut from its four corners.

Area of remaining part is 196 sq. cm. Take $\sqrt{2}=1.4$

Quantity II : Percentage increase in area of rectangle. Increase in length and breadth are 20% and 15% respectively.

- (a) Quantity I ≥ Quantity II
- (b) Quantity I ≤ Quantity II
- (c) Quantity I = Quantity II or no relation can be established
- (d) Quantity I > Quantity II
- (e) Quantity I < Quantity II

5. Average of P and Q is 12, while the sum of Q and R is 12. $14 \geq (P, Q) \geq 8$ and $10 \geq Q$ and $R \geq 2$; Given P, Q, R are integers. **(SBI Clerk Mains-2023)**

Quantity I : Value of PQ – 54

Quantity II : (P + R) × Q

- (a) Quantity I ≥ Quantity II
- (b) Quantity I ≤ Quantity II
- (c) Quantity I = Quantity II or no relation can be established
- (d) Quantity I > Quantity II
- (e) Quantity I < Quantity II

DIRECTIONS (Qs. 6-8): The following questions are accompanied by two or three statements. You have to determine which statements(s) is/are sufficient/necessary to answer the questions. **(SBI Clerk Mains-2023)**

6. What is the present age of Father?
 I. The difference between the ages of Father and Son is 45 years.
 II. The present age of Son is $\frac{1}{4}$ th of the present age of the Father.
 III. The sum of the ages of Father and Son is 75 years.
 (a) Any two of them (b) Only I and III
 (c) Only I and II (d) All I, II and III
 (e) None of these

7. If a wire is cut into three pieces of unequal lengths, what is the length of the shortest of these pieces of wire?

Statement I. The combined length of the longer two pieces of wire is 35 meters.

Statement II. The combined length of the shorter two pieces of wire is 30 meters.

- (a) The data is statement I alone is sufficient to answer the question, while the data in statement II alone is not sufficient to answer the question.

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

8. Two friends P and Q together can complete a piece of work in 20 days. In how many days can P alone complete the piece of work?

Statement I. Q alone completes half of the work in 25 days.

Statement II. The efficiency of P is 50% more than that of Q.

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

9. Anna, Binna, Chinna enter into a partnership with their total initial investment of Rs. 16200. Anna invested for 1 year while Binna and Chinna invested for same time period, Find the time period for which Binna and Chinna invested their capital. **(RRB Office Asst. Main-2023)**

Statement I: Profit share of Binna is Rs. 2400 out of total annual profit.

Statement II: Ratio of investment of Anna, Binna and Chinna is 5: 3: 10 respectively and profit share of person Anna is Rs. 2400.

- (a) Statment I is alone sufficient
- (b) Statment II is alone sufficient
- (c) Either I or II
- (d) Both the Statement I and II together sufficient
- (e) None of these

10. p and q are positive integers. Is $\frac{p \times q}{25}$ is an integer?

(RRB Office Asst. Main-2023)

Statement I: Both p and q are multiple of 5.

Statement II: p * q is a multiple of 20.

- (a) Statment I is alone sufficient
- (b) Statment I and II both are sufficient
- (c) Either Statement I or II
- (d) Statment II is alone sufficient
- (e) None of these

DIRECTIONS (Qs. 11-12): 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 all the statements and give answer. **(RRB Officer Scale-I Prelim-2023)**

- (a) If the data in statement I alone is sufficient to answer the question, while the data in statement II alone is not sufficient to answer the question.

- (b) If the data in statement II alone is sufficient to answer the question, while the data in statement I alone is not sufficient to answer the question.
- (c) If the data either in statement I alone or in statement II alone is sufficient to answer the question.
- (d) If the data in both statements I and II together are necessary to answer the question.
- (e) If the data given in both statements I and II together are not sufficient to answer the question.
11. Two digit number is D . Find the number
Statement I: Tens digit is even number and difference between both digit is 3.
Statement II: Sum of number D and when D is reversed is 77.
12. Find the initial quantity of water in the mixture.
Statement I: 30 litres of water is added to the mixture of juice and water, then the ratio quantity of juice and water is 2 : 1 respectively.
Statement II: The initial quantity of mixture (juice+water) and water is in the ratio 6 : 1.

DIRECTIONS (Qs. 13-15): The question given below is followed by some statements. Read the question carefully and determine which of the given statements is/are necessary/required to answer the question. (RRB Officer Scale-I Mains-2023)

- (a) Only I alone (b) Only II alone
 (c) Either I or II alone (d) Both together
 (e) Neither I nor II
13. Ratio of juice and water in a mixture is 8 : 7. Find the difference between the total quantity of the mixture and the quantity of juice.
 I. If same amount of water which is present in the initial mixture is added into it, then the difference between juice and water becomes 96 litres.
 II. If 44 litres of juice is added, then the ratio of juice and water become 4:3.
14. There are two articles (P and Q) in a shop. Find the discount given on article P.
 I. Marked price of article Q is 130 more than double the selling price of article
 P. Profit made by selling article Q is ₹50 more than that by selling article P. Article P was marked up 50% above its cost price.
 II. Selling price of article Q is ₹.1200 and 20% discount was given on article Q.
15. The ratio of ages of K and M 12 years ago was 9 : 7 respectively. The ratio of present ages of J and K is a:b. Find the value of $a \times b$ (a,b are coprime)
 I. The average ages of J and L is 16 years more than that of K and M.
 II. The present age of L is 40 more than double the difference between present age of K and M.

DIRECTIONS (Qs. 16-20): Calculate Quantity I and Quantity II on the basis of the given information then compare them and answer the following questions accordingly.

(RRB Officer Scale-I Mains-2023)

- (a) Quantity I > Quantity II
 (b) Quantity I < Quantity II
 (c) Quantity I ≤ Quantity II

- (d) Quantity I = Quantity II or No relation
 (e) Quantity I ≥ Quantity II
16. **Quantity I:** Lavnya invested 40% of her savings ₹ 10,000 at a simple interest rate of 12% per year and the remainder at a simple interest rate of 18% per year. Calculate the total interest she earned after 3 years.
Quantity II: 3 * [the interest accrued when Yuvi invests ₹ 3,600 at a simple interest rate of 15% per year for 8 (2/3) years]
17. **Quantity I:** Determine the present age of J, given that 8 years ago, K's age was 42 years, Additionally, five years from now, the ratio of L's and K's ages will be 9 : 11, and J's age, 10 years from now, will be 30% less than L's age at that time.
Quantity II: If K's age will be 40% more than his current age ten years hence from now, and the present ratio of K's and L's ages is 5 : 7, find L's current age.
18. Mixture A contains 60 liters mixture of milk and water and Mixture B contains x litres mixture of milk and water in the ratio of 3 : 2.
Quantity I: If the quantity of water in mixture A is equal to the quantity of the milk in mixture B and the difference between quantity of the milk and water in mixture B is 8 liters, then the quantity of water in mixture A is what percent of the quantity of milk in mixture A?
Quantity II: If the quantity of water in mixture B is 16 litres, then the total quantity of the mixture in mixture B is what percent of the total quantity of the mixture in mixture A?
19. **Quantity I:** Pawan sells two articles P and Q. He sells one at the loss of 20% and other at the profit of 4% but finally he observes that there is no loss or gain. If the total selling price of these two articles is ₹.36,000, find the difference between their cost prices?
Quantity II: A Mohan buys 3 cows and 4 sheep in ₹.32400. Instead, if he buys 2 cows and 5 sheep he will have to pay ₹.9015 less. What is the cost price of one cow?
20. **Quantity I:** Find the probability that the sum of the two outcomes on two different rolls of a same dice will be less than 6.
Quantity II: Vikas rolled two dice together. What is the probability that first dice showed a multiple of 3 and the second dice showed an even number?

DIRECTION (Qs. 21-24): In the following questions two values are coded as X and Y. Find the values of X and Y then answer as (RBI Asst. Mains-2023)

- (a) If $X > Y$ (b) If $X < Y$
 (c) If $X = Y$ (d) If $X \geq Y$ or $X \leq Y$
 (e) If relation can't be established between X and Y
21. A, B and C can complete a piece of work in 30 days. If A and B start the work and they left after 10 days then $\frac{3}{4}$ work is remaining for C. If B works alone for 30 days then $\frac{1}{2}$ work is remaining for A and C then
 X = No of days required for A for whole work
 Y = No of days required for C for whole work
22. Respective ratio of Meera and her mother is 3:8. 8 years hence age of Meera's brother is half of her mother. If

- Meera is 6 years younger than her brother than ;
 X = Sum of ages of meera and her brother
 Y = age of mother
23. A can complete a piece of work in 50 days. A is 25% more efficient than B. If A and B can complete the same work in 10 days with the help of C then
 X = number of days required for B to complete whole work alone
 Y = number of days required for C to complete whole work alone
24. Speed of boat in still water is 2 times to speed of current. If a person covers 50 km in 10 hrs in upstream then;
 X= time required to cover 40 km in downstream
 Y = time required to cover 30 km in upstream

25. Quantity 1: $\frac{(2x^3 + 2y^3)(x - y)}{(6x^2 - 7xy + 2y^2 + 5xy - 4x^2)(x^2 - y^2)}$
 Quantity 2: $b < (-1) < a$, then value of $-2b + a$
(IBPS PO Mains-2023)
 (a) Quantity 1 > Quantity 2 (b) Quantity 1 < Quantity 2
 (c) Quantity 1 ≥ Quantity 2 (d) Quantity 1 ≤ Quantity 2
 (e) Quantity 1 = Quantity 2 or can not be determined

26. There are two boxes P and Q having cubes of colours red, blue, green and yellow. They have 3 and 4 coloured cubes (not necessarily in same order). Only one of the boxes has yellow colour cubes. In box P difference between red and blue colour cubes is 6. In both boxes the number of green cubes is half of red colour cubes. The difference between red and blue cubes of box B is 5. The yellow cubes are 3 more than number of green cubes in the box containing yellow cubes. Average number of cubes in box P and Q are 48 & 37 respectively.
(IBPS PO Mains-2023)
 Quantity I: Find the difference between blue cubes of P & red cubes of box Q.
 Quantity II: Difference between yellow cubes of box containing it and number of green cubes in box Q.
 (a) Quantity 1 > Quantity 2 (b) Quantity 1 < Quantity 2
 (c) Quantity 1 ≥ Quantity 2 (d) Quantity 1 ≤ Quantity 2
 (e) Quantity 1 = Quantity 2 or can not be determined

DIRECTIONS (27-30): In the following questions, two statements are numbered as A and B. On solving these statements, we get quantities A and B respectively. Solve both quantities and choose the correct option. **(IBPS Clerk Mains-2023)**

- (a) Quantity A ≥ Quantity B
 (b) Quantity A ≤ Quantity B
 (c) Quantity A < Quantity B
 (d) Quantity A > Quantity B
 (e) Quantity A = Quantity B or No relation
27. **Quantity A:** $(x-6)(2x-5) 2z^n = 0$
 n = smallest whole number
Quantity B: $y^3 = 343$
28. Ratio of water to juice in a mixture A is 9 : 7. 80 litre of this mixture is taken put and remaining mixture is named as mixture B. When 8 L of water is added to B, then a new mixture C is formed in which ratio of juice to water becomes 5:7.
Quantity A: Find and quantity of water in mixture B.
Quantity B: 91 litre
29. P and Q started a business with initial investment of Rs. (x+Y), (Y-X). After 4 months P increased his investment

- by Rs. 2000. After 6 months from the starting R joined them with investment of Rs. (2X-Y). If at the end of the year ratio of profit of P to that of Q and R together is 7:3.
Quantity A: 30% of (15Y-90X)
Quantity B: Find the value of double the initial investment of R, if profit share of Q and R is equal and X+Y = 35000
30. **Quantity A:** Find the area (in cm²) of a square whose area is equal to the area of rectangle and sum of side of square and width of rectangle is 20 cm more than the length of rectangle and perimeter of rectangle is 40 cm.
Quantity B: Area of a circle is more than or equal to the area of a rectangle of sides 32 cm and 2 cm.

DIRECTIONS (31-34): 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 all the statements and give answer. **(IBPS Clerk Mains-2023)**

- (a) If the data is statement I alone is sufficient to answer the question, while the data in statement II alone is not sufficient to answer the question.
 (b) If the data in statement II alone is sufficient to answer the question, while the data in statement I alone is not sufficient to answer the question.
 (c) If the data either in statement I alone or in statement II alone is sufficient to answer the question.
 (d) If the data in both statements I and II together are necessary to answer the question.
 (e) If the data given in both statements I and II together are not sufficient to answer the question.
31. Set P contains four consecutive odd numbers while set Q contains 6 consecutive even numbers. Find the sum of largest numbers from both the sets.
Statement I: Largest number of set P is 1 less than the smallest number of set Q.
Statement II: Sum of smallest number from both the sets together is 29.
32. Ratio of marked price of item Y to the selling price of item X is 5:4, then find the profit earned after selling item X.
Statement I: 20% discount offered on item X and total profit amount earned after selling both the items together is Rs. 130.
Statement II: Profit % earned after selling item Y is 16.66% and marked up percent on item Y is 66.66%.
33. When length of a rectangle was increased by 20% and breadth remains constant then area was increased by 100 sq.cm. What is the perimeter of the rectangle.
Statement I: After increasing the length, the rectangle becomes a square.
Statement II: After increasing the length, all the angles of the rectangle becomes 90 degree.
34. Raj invested a sum of Rs. 80,000 in scheme P offering simple interest. What is the interest earned by him after 2 years?
Statement I: If Kamal had invested the same money for same time at the same rate of interest but compounded annually, he would have gained Rs. 1800 more.
Statement II: Scheme Q offers an interest rate of 10%, compounded annually. If Kamal had invested the money partially in Scheme P and rest in scheme Q, then the interest earned by him after 2 years will be Rs. 15600.

HINTS & EXPLANATIONS

Simplification

1. (e) $500 \times 18 \div 6 + 3 + 2$ of 5 of 3
 $= 1500 + 3 + 30 = 1533$
2. (d) $28 \times 7 + 5 \times 4 - 56 \times 2 + 169 \div 13 = ? \div 24$
 $196 + 20 - 112 + 13 = x \div 24$
 $x = 117 \times 24$
 $x = 2808$
3. (b) 20% of 2000 - 25% of 1000 = 2% of 500 + (?)
 $400 - 250 = 10 + ?$
 $? = 150 - 10$
 $? = 140$
4. (d) $760 \div 19 + 8 \times 5 + 7 - 2 + ? = 156$
 $40 + 40 + 5 + ? = 156$
 $? = 156 - 85$
 $? = 71$
5. (c) $25 \times 400 - 20 \times 200 + 100 \div 2 = ? \times 30 \div 3$
 $10000 - 4000 + 50 = ? \times 10$
 $? = \frac{6050}{10}$
 $? = 605$
6. (e) $90 \times 2 + 6 + ? + 18 \div 3 \times 9 = 300$
 $180 + 6 + ? + 54 = 300$
 $? = 300 - 240$
 $? = 60$
7. (e) $1105 - 15 \times [4 \times (140 - 95)] \div 5 + 100 = ?$
 $1105 - 15 \times 180 \div 5 + 100 = ?$
 $1105 - 15 \times 36 + 100 = ?$
 $1105 - 540 + 100 = ?$
 $? = 665$
8. (a) 50% of 180 - 30% of 150 = ? + $(500 - 55 \times 4) \div 8$
 $90 - 45 = ? + (500 - 220) \div 8$
 $? = 45 - 35$
 $? = 10$
9. (c) $(842 + 598 - 111) \div 3 = 693 - 73 + ?$
 $443 = 620 + ?$
 $? = -177$
10. (e) $45 \times 18 + 135 \times 49 + 89 \times 43 = ? + \sqrt{169}$
 $810 + 6615 + 3827 = ? + 13$
 $? = 11252 - 13$
 $? = 11239$
11. (b) $\sqrt{324} \times 4 - 40 + 7^2 = 5^3 + 65 - ?$
 $72 - 40 + 49 = 125 + 65 - ?$
 $? = 190 - 81$
 $? = 109$
12. (e) $(952 + 348) \div 260 + 14^2 = ?$
 $1300 \div 260 + 196 = ?$
 $? = 201$
13. (e) $\sqrt{289} \times 5 + 25 \times 20\%$ of 750 - $486 \div 3 = ?$
 $85 + 25 \times 150 - 162 = ?$
 $? = 3750 + 85 - 162$
 $? = 3637$

$$14. (b) 17\frac{4}{3} \div 3\frac{2}{3} + 6\frac{2}{3} \times \frac{3}{2} - 10.5\% \text{ of } 110 = ?$$

$$= \frac{55}{3} \times \frac{3}{11} + \frac{20}{3} \times \frac{3}{2} - 11.55 = ?$$

$$? = 5 + 10 - 11.55$$

$$? = 3.45$$

$$15. (d) 24\% \text{ of } 840 + 64\% \text{ of } 940 = 32\% \text{ of } ?$$

$$201.6 + 601.6 = 0.32 \times ?$$

$$? = \frac{303.2}{0.32}$$

$$? = 2510$$

$$16. (b) 1. a^b b^a (c^d + d^c) = c^d d^c (a^b + b^a)$$

$$\frac{a^b b^a}{a^b + b^a} = \frac{c^d d^c}{c^d + d^c}$$

$$\frac{a^b + b^a}{a^b b^a} = \frac{c^d + d^c}{c^d d^c}$$

$$\frac{1}{b^a} + \frac{1}{a^b} = \frac{1}{d^c} + \frac{1}{c^d}$$

$$2. \frac{1}{a^b} - \frac{1}{d^c} = \frac{1}{c^d} - \frac{1}{b^a}$$

$$\frac{d^c - a^b}{a^b d^c} = \frac{b^a - c^d}{c^d b^a}$$

If $d^c - a^b = 0$ (For all real values of a, b, c and d)

$$b^a - c^d = 0$$

$$a, b, c, d \neq 0$$

$$3. \text{ If } c = 0$$

$$\frac{1}{b^a} + \frac{1}{a^b} = \frac{1}{d^c} + \frac{1}{c^d}$$

$$\frac{1}{b^a} + \frac{1}{a^b} = \frac{1}{d^0} + \frac{1}{0^d}$$

$$\frac{a^b + b^a}{b^a a^b} = 1$$

$$a^b + b^a = b^a a^b$$

$$a^b + b^a \neq 1$$

Only 1 and 2 is correct.

$$17. (a) 275 - 12 \times 7 + 24 = ?$$

$$\Rightarrow ? = 299 - 84 \Rightarrow ? = 215$$

$$18. (b) \frac{70}{100} \times 450 + \frac{30}{100} \times 230 = ? \times \frac{20}{100}$$

$$\Rightarrow 315 + 69 = ? \times \frac{1}{5}$$

$$\Rightarrow ? = 384 \times 5 = 1920$$

$$19. (b) \frac{22}{9 \times 7} \times 189 + 234 = ? \Rightarrow ? = 66 + 234 = 300$$

20. (c) $35(61 - 18) = ? + 60$
 $\Rightarrow ? = 35 \times 43 - 60 \Rightarrow ? = 1505 - 60 \Rightarrow ? = 1445$

21. (d) $? = \frac{2197}{13} + 95 \times 114$
 $\Rightarrow ? = 169 + 10830 = 10999$

22. (c) $\frac{35}{100} \times 180 + \frac{50}{100} \times 300 = \frac{40}{100} \times ?$
 $\Rightarrow \frac{2}{5} \times ? = 63 + 150 = 213 \Rightarrow ? = 213 \times \frac{5}{2} = 532.5$

23. (d) $(34 \times 30) \div 17 + 256 = ?$
 $\Rightarrow ? = 60 + 256$
 $\Rightarrow ? = 316$

24. (a) $\frac{22.5}{4} - \frac{36}{15} = ? \Rightarrow ? = \frac{45}{8} - \frac{12}{5} = \frac{225 - 96}{40}$
 $\Rightarrow ? = \frac{129}{40}$

25. (e) $\left(\frac{84 \times 84}{28} \times 8\right) \times \frac{1}{28} = 6 \times ?$
 $\Rightarrow 6 \times ? = 3 \times 3 \times 8 \Rightarrow ? = \frac{72}{6} \Rightarrow ? = 12$

26. (a) $\frac{3430}{49} - 37 = ? \Rightarrow ? = 70 - 37 = 33$

27. (c) $\frac{80}{100} \times 200 - 30 + \frac{50}{100} \times 40 - 18 = ?$
 $\Rightarrow ? = 160 - 30 + 20 - 18$
 $\Rightarrow ? = 180 - 48 = 32$

28. (b) $\frac{11 \times 12}{3} + 4 = ? \Rightarrow ? = 44 + 4 = 48$

29. (d) $1500 - \frac{6}{100} \times 800 - 114 = ?$
 $\Rightarrow ? = 1500 - 48 - 114 \Rightarrow ? = 1500 - 162 = 1338$

30. (c) $\frac{16 \times 14}{7 \times 32} + 9 = ? \Rightarrow ? = 1 + 9 = 10$

31. (e) $8 \div 32 + 6 \div 3 = \sqrt{?}$
 $\Rightarrow \frac{1}{4} + 2 = \sqrt{?} \Rightarrow \sqrt{?} = \frac{9}{4} \Rightarrow ? = \frac{81}{16}$

32. (b) $2500 - 16000 + 10 = ? \times 5$
 $\Rightarrow ? = \frac{-13490}{5} = -2698$

33. (b) $16 - 13 \times 7 + 170 + 118 = ?$
 $\Rightarrow ? = 304 - 91$
 $\Rightarrow ? = 213$

34. (c) $\frac{35}{100} \times 400 + 4 \times ? = \frac{50}{100} \times 1200$
 $\Rightarrow 140 + 4 \times ? = 600 \Rightarrow ? = \frac{(600 - 140)}{4} = \frac{460}{4}$
 $\Rightarrow ? = 115$

35. (e) $2520 + 8410 + 1235 = ? - 18$
 $\Rightarrow ? = 12165 + 18 \Rightarrow ? = 12183$

36. (c) $\frac{25}{100} \times 700 + \frac{66}{100} \times 500 = ? + \frac{52}{100} \times 400$
 $\Rightarrow 175 + 330 = ? + 208$
 $\Rightarrow ? = 505 - 208 \Rightarrow ? = 297$

37. (c) $\frac{1650}{100} \times ? \times \frac{1}{330} + \frac{150}{100} \times 500 \times \frac{1}{75} = 25$
 $\Rightarrow \frac{5}{100} \times ? + 10 = 25 \Rightarrow ? = \frac{15 \times 100}{5} = 300$

38. (b) $(107 - 56) + (8 \times 3) = ? + 19$
 $\Rightarrow 51 + 24 = ? + 19 \Rightarrow ? = 75 - 19 \Rightarrow ? = 56$

39. (b) $1248 + 933 - 425 = ?$
 $\Rightarrow ? = 2181 - 425 \Rightarrow ? = 1756$

40. (c) $? = \frac{1400}{35} \times 5 + \frac{560}{70}$
 $\Rightarrow ? = 40 \times 5 + 8 \Rightarrow ? = 208$

41. (d) $? = \frac{55}{11} \times (3 \times 8) + 50$
 $\Rightarrow ? = 5 \times 24 + 50 \Rightarrow ? = 170$

42. (d) $? = 38 - \{(17 - 30) + 30\}$
 $\Rightarrow ? = 38 - 17 \Rightarrow ? = 21$

43. (d) $480 - 210 = ?^2 - \frac{100}{100} \times 91$
 $\Rightarrow ?^2 = 270 + 91 \Rightarrow ? = \sqrt{361} = 19$

44. (d) $\frac{6 \times \sqrt{6}}{36 \times \sqrt{6} \times \sqrt{4}} = \frac{?}{180} \Rightarrow \frac{1}{6 \times 2} = \frac{?}{180} \Rightarrow ? = \frac{180}{12} = 15$

45. (c) $20 \times \frac{8}{4} - 27 = ? \Rightarrow ? = 40 - 27 = 13$

46. (b) $\frac{65}{13} \times 58 - ?^2 = 254 \Rightarrow 290 - ?^2 = 254$
 $\Rightarrow ?^2 = 290 - 254 = 36 \Rightarrow ? = \sqrt{36} = 6$

47. (d) $26 - 31 + \frac{261}{29} = ? \Rightarrow ? = 9 - 5 = 4$

48. (c) $? = 430 + 330 - 81$
 $\Rightarrow ? = 760 - 81 \Rightarrow ? = 679$

49. (d) $\frac{90}{18} \times ? - 225 = 500$
 $\Rightarrow 5 \times ? = 500 + 225 = 725 \Rightarrow ? = \frac{725}{5} = 145$

50. (e) $1000 + 280 = 1287 - ? \Rightarrow ? = 1287 - 1280 \Rightarrow ? = 7$

51. (e) $\frac{99}{19} \times 114 - 458 = ? \times 17 \Rightarrow ? = \frac{136}{17} \Rightarrow ? = 8$

52. (e) $\frac{117}{13} + \frac{2197}{169} = ? \Rightarrow ? = 9 + 13 \Rightarrow ? = 22$

53. (a) $\frac{170}{10} + \frac{36}{9} + ? = 91 \Rightarrow ? + 17 + 4 = 91$
 $\Rightarrow ? = 91 - 21 \Rightarrow ? = 70$

54. (b) $280 + 450 - 220 = ? - 700$
 $\Rightarrow ? - 700 = 730 - 220 \Rightarrow ? = 510 + 700 \Rightarrow ? = 1210$
55. (d) $\frac{195}{13} - 160 = 520 - ? \Rightarrow 15 - 160 = 520 - ? \Rightarrow ? = 665$
56. (c) $180 + ? - \frac{343}{7} = 159$
 $\Rightarrow ? + 180 - 49 = 159 \Rightarrow ? + 131 = 159$
 $\Rightarrow ? = 159 - 131 \Rightarrow ? = 28$
57. (e) $\frac{800 \times 5}{16} + ? = 430$
 $\Rightarrow 50 \times 5 + ? = 430 \Rightarrow ? = 430 - 250 \Rightarrow ? = 180$
58. (e) $525 + \frac{32 \times 5}{?} = 845 \Rightarrow \frac{160}{?} = 845 - 525$
 $\Rightarrow ? = \frac{160}{320} = \frac{1}{2} \Rightarrow ? = 0.5$

Approximation

1. (b) $? \times 8 + \frac{45}{100} \times 80 = 33 \times 4 \Rightarrow ? \times 8 = 132 - 36$
 $\Rightarrow ? = \frac{96}{8} = 12$
2. (a) $\frac{25 \times 4}{5} + 16 + (8)^2 = ?^2$
 $\Rightarrow ?^2 \times 20 + 16 + 64 \Rightarrow ? = \sqrt{100} = 10$
3. (c) $18 \times 4 + \frac{25}{5} - 33 = ?$
 $\Rightarrow ? = 72 + 5 - 33 \Rightarrow ? = 77 - 33 = 44$
4. (b) $70 - 20 \times 2 + 36 \times 1 = ?$
 $\Rightarrow ? = 70 - 40 + 36$
 $\Rightarrow ? = 70 - 4 = 66$
5. (b) $\frac{71}{300} \times \sqrt{323.91} + (11.97^2 \div \sqrt[3]{26.949})\% \text{ of } \sqrt{1679}$
 $= 30\% \text{ of } x + 2.87$
 $\frac{70}{300} \times 18 + (144 \div 3) \times \frac{1}{100} \text{ of } 40 = \frac{30x}{100} + 3$
 $4.2 + 48 \times \frac{1}{100} \text{ of } 40 = 0.3x + 3$
 $4 + 20 = 0.3x + 3 \Rightarrow x = \frac{21}{0.3} = 70.$
6. (b) $\left(\frac{\sqrt{121} \div 11 + \sqrt{64}}{3} \right) \times \frac{15}{3} = ?$
 $\Rightarrow \left(\frac{11 \div 11 + 8}{3} \right) \times \frac{15}{3} = ? \Rightarrow \left(\frac{1+8}{3} \right) \times 5 = ?$
 $\therefore ? = 15$
7. (e) $125 \times 64, 25 + 169 \times 14, 13 + 123 = (?)^2$
 $5 \times 64 + 13 \times 14 + 123 = (?)^2$
 $320 + 182 + 123 = (?)^2$
 $\therefore ? = \sqrt{625} = 25$

8. (a) $\left(\frac{\sqrt{441}}{7} \times 12 \right) - \frac{25}{100} \text{ of } 400 + (16 + 18) - (\sqrt[3]{1728} \times 5)$
 $-\left(\frac{16 \times 35}{7} \right) = x$
 $\frac{21 \times 12}{7} - 100 + 288 - (12 \times 5) - (16 \times 5) = x$
 $36 + 188 - 60 - 80 = x$
 $\therefore x = 84$
9. (c) $\frac{(517 + 37 + 472)}{114} \times ? = 576$
 $\frac{1026}{114} \times ? = 576$
 $\therefore ? = \frac{576 \times 114}{1026} = 64$
10. (a) $\sqrt{900} \times (12)^2 + ? \approx 5000$
 $[898 \approx 900; 12.005 \approx 12]$
 $\Rightarrow 30 \times 144 + ? \approx 5000$
 $\Rightarrow ? \approx 5000 - 4320 \approx 680$
11. (b) $? \approx \frac{3745}{24} \times 18 \approx 2808.75$
 $\therefore \text{Required answer} = 2800$
12. (a) It can be rounded off to the nearest ten's places.
 $1002 \approx 1000; 49 \approx 50; 99 \approx 100$ and $1299 \approx 1300$
 Now the equation will become
 $1000 \div 50 \times 100 - 1300 = ?$
 $20 \times 100 - 1300 = ?$
 $2000 - 1300 = ?$
 $? = 700$
13. (d) The difference between two nearest values is 70 (210 and 280). So round off the numbers to the nearest integers. $29.8\% \text{ of } 260 \approx 30\% \text{ of } 260; 60.01\% \text{ of } 510 \approx 60\% \text{ of } 510$ and $103.57 \approx 104$
 Now the equation will become
 $30\% \text{ of } 260 + 60\% \text{ of } 510 - 104 = ?$
 $30/100 \times 260 + 60/100 \times 510 - 104 = ?$
 $78 + 306 - 104 = ?$
 $? = 384 - 104 = 280$
14. (a) $(21.98)^2 \approx (22)^2$
 $(25.02)^2 \approx (25)^2$
 and $(13.03)^2 \approx (13)^2$
 The equation will become
 $22^2 - 25^2 + 13^2 = ?$
 $484 - 625 + 169 = ?$
 $653 - 625 = ?$
 $? = 28$ so the nearest value is 25
15. (c) $?^2 \times 19 - 385 = (8.4)^3 + 229$
 $\Rightarrow ?^2 \times 19 + 600 + 229 + 385$
 $\Rightarrow ?^2 = \frac{1214}{19} = 63.89 \approx 64 \Rightarrow ? = \sqrt{64} = 8$

16. (a) $\frac{30}{100} \times 300 + \frac{45}{100} \times 200 = \sqrt{?} + 164$
 $\Rightarrow 90 + 90 = \sqrt{?} + 164 \Rightarrow \sqrt{?} = 180 - 164 = 16$
 $\Rightarrow ? = (16)^2 = 256$
17. (b) $48 \times 10 + 3 + (34)^2 = ? \times 47$
 $\Rightarrow ? \times 47 = 483 + 1156$
 $\Rightarrow ? = \frac{1639}{47} = 34.87 \approx 35$
18. (d) $\sqrt{2304} \times 18 + \sqrt{18 + 16 + 3 \times 5}$
 $= 48 \times 18 + \sqrt{49} = 864 + 7 = 871$
19. (c) $(\sqrt{16} + \sqrt{25})^2 + 141 - 2 \times \sqrt{400} = ?^2 - 107$
 $\Rightarrow (4 + 5)^2 + 141 - 2 \times 20 + 107 = ?^2$
 $\Rightarrow ?^2 = 81 + 141 - 40 + 107 = 289 \Rightarrow ? = \sqrt{289} = 17$

Series

1. (c) $150, 141, 131, 120, 110, 95$
 Differences: $-9, -10, -11, -12, -13$
 Hence, the wrong term in the series is 110.
2. (c) $25 + 25 = 50$
 $36 + 36 = 72$
 $49 + 49 = 98$
 $64 + 64 = 128$
 $81 + 81 = 162$
 $100 + 100 = 200$
 The wrong term is 164.
3. (d) $81, 118, 151, 180, 197, 206$
 Differences: $+37, +33, +27, +19, +9$
 Second differences: $-4, -6, -8, -10$
4. (c) $10, 10, 20, 25, 240, 1200$
 Multipliers: $\times 1, \times 2, \times 3, \times 4, \times 5$
5. (e) $(2)^2 + 1 = 5$
 $(3)^2 - 1 = 8$
 $(4)^2 + 1 = 17$
 $(5)^2 - 1 = 24$
 $(6)^2 + 1 = 37$
 $(7)^2 - 1 = 48$

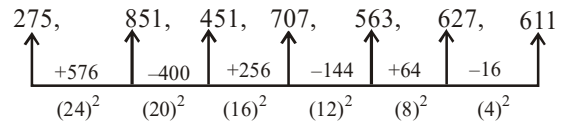
Sol. (6-7):

Pattern of the series-
 $0.5 \times 14 = 7 \neq 6$
 $7 \times 12 = 84$
 $84 \times 10 = 840$
 $840 \times 8 = 6720$

6. $6720 \times 6 = 40320$
 $40320 \times 4 = 161280 = a$
6. (c) $a - 112809 = 161280 - 112809 = 48471$
7. (b) 6 is wrong number in the series.

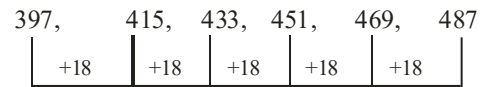
Sol. (8-10):

I. Pattern of the series-



So, $a = 275, b = 851, c = 451$

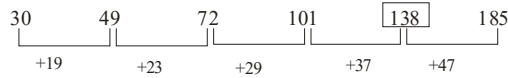
II. Pattern of the series-



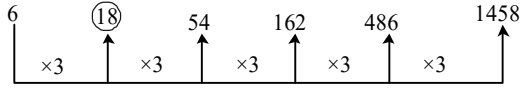
So, $x = 397$ and $y = 487$.

8. (a) (i) $y = a + b$
 $\Rightarrow 487 = 275 + 851 \Rightarrow 487 \neq 1126$ (Not true)
- (ii) $y = 446 + \frac{1}{11} \times C \Rightarrow 487 = 446 + \frac{1}{11} \times 451$
 $\Rightarrow 487 = 446 + 41 \Rightarrow 487 = 487$ (True)
- (iii) $x + b = \frac{1}{2}y \Rightarrow 397 + 851 = \frac{1}{2} \times 487$
 $\Rightarrow 1248 \neq 243.5$ (Not true)
 Hence, only (ii) is true.
9. (b) $z + 487 = 576$
 $\Rightarrow z = 576 - 487 = 89$
 Hence, average of c and $z = \frac{451 + 89}{2} = \frac{540}{2} = 270$.
10. (c) $a = 275$
 Second largest single digit prime number = 5
 Hence, resultant = $\frac{275}{5} = 55$
11. (c) $400, 199, 198, 296, 591, 1476.5$
 Multipliers: $\times 0.5 - 1, \times 1 - 1, \times 1.5 - 1, \times 2 - 1, \times 2.5 - 1$
12. (a) $75, 150, 306, 526, 795, 1100$
 Differences: $75, 156, 220, 269, 305$
 Second differences: $81, 64, 49, 36$
13. (c) $34, 249, 373, 436, 462, 469$
 Differences: $(6)^3 - 1, (5)^3 - 1, (4)^3 - 1, (3)^3 - 1, (2)^3 - 1$
14. (d) $27, 40, 23, 36, 19, 32, 15$
 Differences: $+13, -17, +13, -17, +13, -17$
15. (b) $30, 31.2, 33.6, 40.8, 69.6, 213.6$
 Differences: $+1.2, +2.4, +7.2, +28.8, +144$

16. (c)



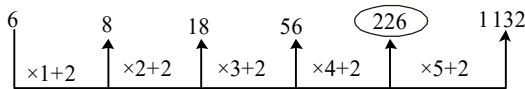
17. (e) Pattern of the series:



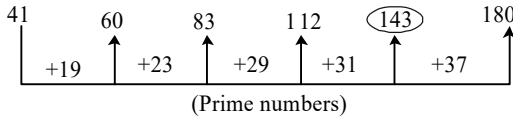
18. (b) Pattern of the series:



19. (d) Pattern of the series



20. (c) Pattern of the series



21. (a) Pattern of the series:

109 → 113 → 127 → 131 → 137 → 139
(continuous prime numbers)

22. (c) $40 + 3^3 = 67$

$67 + 4^3 = 91$

$91 + 5^3 = 216$

$216 + 6^3 = 432$

$432 + 7^3 = 775$

Thus the missing number is 67

23. (d) $85 + 30 = 115$

$115 - 40 = 75$

$75 + 50 = 125$

$125 - 60 = 65$

$65 + 70 = 135$

$135 - 80 = 55$

Thus the missing number is 55

24. (b) $734 - 11^2 = 613$

$613 - 12^2 = 469$

$469 - 13^2 = 300$

$300 - 14^2 = 104$

$104 - 15^2 = -121$

Thus the missing number is -121

25. (a) $(40 \times 7) = 280$

$(280 \times 6) = 1680$

$(1680 \times 5) = 8400$

$(8400 \times 4) = 33600$

$(33600 \times 3) = 100800$

Thus the missing number is 40

26. (d) $51 + (11 \times 5) = 106$

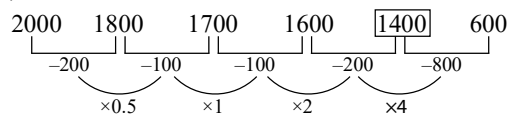
$106 + (11 \times 7) = 183$

$183 + (11 \times 9) = 282$

$282 + (11 \times 11) = 403$

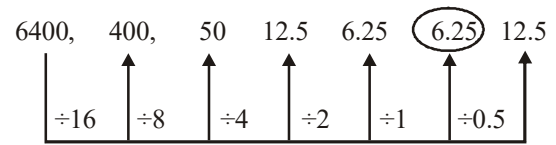
$403 + (11 \times 13) = 546$

27. (a)

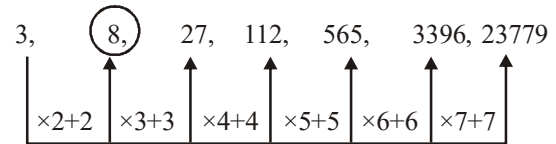


The value of ? is 1400

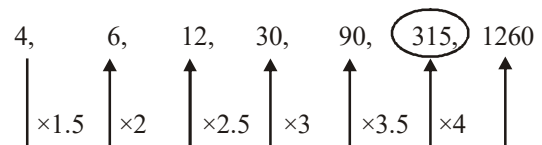
28. (c) Pattern of the series-



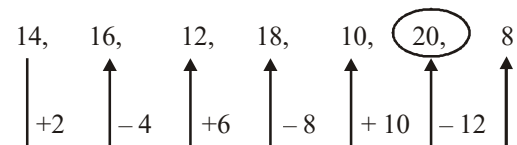
29. (d) Pattern of the series-



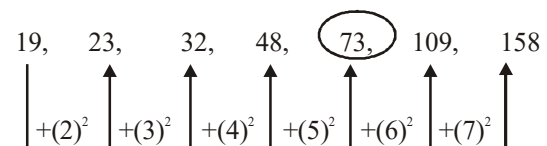
30. (a) Pattern of the series-



31. (b) Pattern of the series-



32. (e) Pattern of the series-



33. (e) $\sqrt{(3b)^2 + b^2} = 4\sqrt{10} \Rightarrow \sqrt{10b^2} = 4\sqrt{10}$

$\Rightarrow b\sqrt{10} = 4\sqrt{10} \Rightarrow \boxed{b=4}$

$\therefore \boxed{a=3 \times 4=12}$

I. $x^2 - (4+12)x + 39 = 0 \Rightarrow x^2 - 16x + 39 = 0$
 $\Rightarrow x^2 - 13x - 3x + 39 = 0 \Rightarrow (x-13)(x-3) = 0$
 $\Rightarrow x = 3, 13$

II. $y^2 - (18-1)y + 72 = 0 \Rightarrow y^2 - 17y + 72 = 0$
 $\Rightarrow y^2 - 9y - 8y + 72 = 0 \Rightarrow (y-9)(y-8) = 0$
 $\Rightarrow y = 8, 9$

Hence, the relationship cannot be determined.

34. (a) $88 = 2 \times 2 \times 2 \times 11$

So, $a = 8$ and $b = 11$ as $1 < a < b$

I. $x^2 - 8x - 105 = 0 \Rightarrow x^2 - 15x + 7x - 105 = 0$
 $\Rightarrow (x-15)(x+7) = 0 \Rightarrow x = 15, -7$

II. $y^2 + 11y + 6y + 72 = 0$
 $\Rightarrow y^2 + 17y + 72 = 0 \Rightarrow y^2 + 9y + 8y + 72 = 0$
 $\Rightarrow (y+9)(y+8) = 0 \Rightarrow y = -8, -9$

Hence, $x > y$.

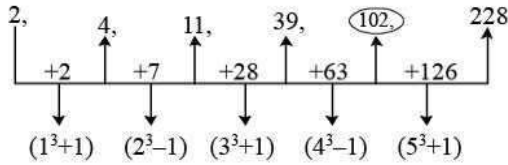
35. (e) I. $x^3 + 2x^2 - 99x = 0$
 $\Rightarrow x^2 + 2x - 99 = 0 \Rightarrow x^2 + 11x - 9x - 99 = 0$
 $\Rightarrow (x+11)(x-9) = 0 \Rightarrow x = 9, -11$

II. $y^3 + 4y^2 - 117y = 0 \Rightarrow y^2 + 4y^2 - 117 = 0$
 $\Rightarrow y^2 + 13y - 9y - 117 = 0 \Rightarrow (y+13)(y-9) = 0$
 $\Rightarrow y = 9, -13 = 0$

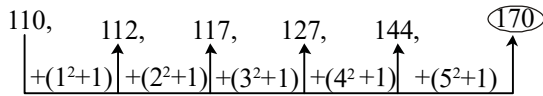
As, $9 > -11 > -13$

Hence, the relationship cannot be established.

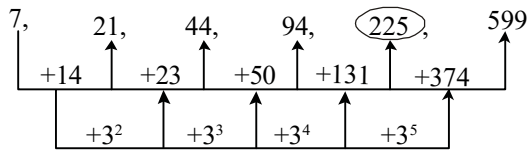
36. (b) Pattern of the series-



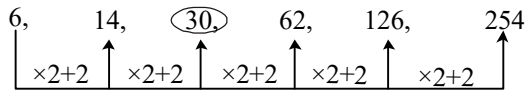
37. (d) Pattern of the series-



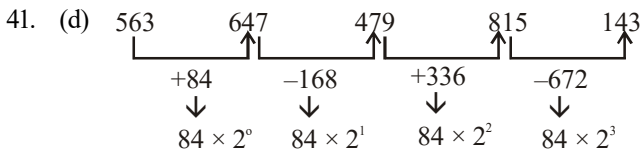
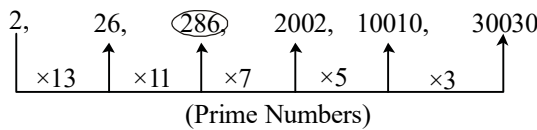
38. (c) Pattern of the series-



39. (b) Pattern of the series-



40. (a) Pattern of the series-

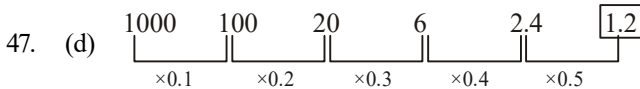
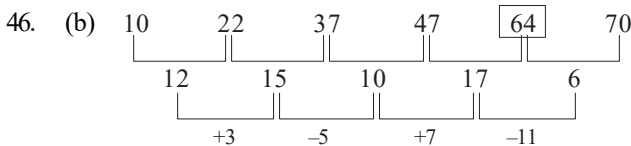


42. (c) The given sequence is a combination of two series:
 I. 13, 24, 35, 46, 57 II. 32, 43, ?, 65, 76
 The pattern in both I & II is +11. So, missing term is 43 + 11 = 54

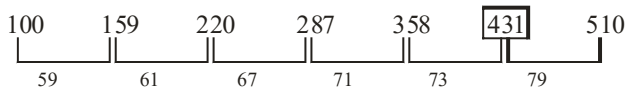
43. (d) The series is as follows: $\times 2 + 35$
 Hence, $? = 701 \times 2 + 35 = 1437$

44. (b) The series is as follows:
 $-12^2, -10^2, -8^2, -6^2, -4^2$
 Hence, $? = 353 - 4^2 = 337$

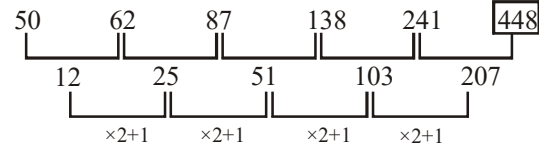
45. (b) The series is as follows:
 $\div 2 + 8$
 Hence, $? = 1012 \div 2 + 8 = 514$



48. (a)



49. (d)

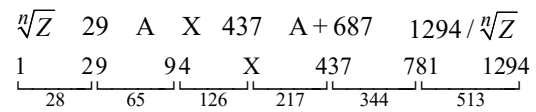


50. (a) 100, 126, 176, 258, 380, 550
 $+(5^2+1) + (7^2+1) + (9^2+1) + (11^2+1) + (13^2+1)$

51. (d) The difference between 29 and A is 'P'.
 $P = 13 \times 5 \times B$
 $P = 13 \times 5 \times 1$

$P = 65$

$A = 65 + 29 = 94$



- $(3)^3 + 1 = 28$
- $(4)^3 + 1 = 65$
- $(5)^3 + 1 = 126$
- $(6)^3 + 1 = 217$
- $(7)^3 + 1 = 344$
- $(8)^3 + 1 = 513$

$X = 94 + 126 = 220$

$Z + X = 1 + 220 = 221$

52. (a) $A + 20 = 94 + 20 = 114$
 $Z = 1$

The LCM of 114 and 1 is = 114

53. (d) Series I: 60, 120, 24, 48, 9.6, 19.2
 Series II: 100, 200, 40, 80, 16, 32

$A = 200, B = 40, C = 80, D = 16$

Required difference $= (B + C) - (C + D)$
 $= (40 + 80) - (80 + 16)$
 $= 120 - 96 = 24$

54. (c) $A - B = 200 - 40 = 160$
 160, 320, 64, 128, 25.6, 51.2
 The 3rd term of the newly formed series is '64'.

55. (c) $\frac{C}{A} = \frac{80}{200} = \frac{2}{5}$

$\frac{A - B}{16} = \frac{200 - 40}{16} = \frac{160}{16} = 10 - \frac{b}{a} = \frac{2}{5} + 10 = \frac{52}{5}$

$\frac{c}{a} = \frac{2}{5} \times 10 = \frac{4}{1} \times \frac{5}{5} = \frac{20}{5}$

$ax^2 + bx + c$

$5x^2 - 52x + 20 = 0$

$x^2 - \frac{52}{5}x + 4 = 0$

56. (d) Series-I: 808, 520, 352, 232, X, 160

$17^2 - 1 = 288$

$13^2 - 1 = 168$

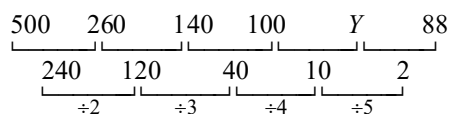
$11^2 - 1 = 120$

$$7^2 - 1 = 48$$

$$5^2 - 1 = 24$$

$$X = 232 - 48 = 184$$

Series-II: ss



$$Y = 100 - 10 = 90$$

$$X - 12^2$$

$$184 - 144 = 40$$

57. (d)

$$Y = 90$$

$$Y + 12 = 102$$

$$Y + 36 = 126$$

$$\text{The average is} = \frac{90 + 102 + 126}{3} = \frac{318}{3} = 106$$

58. (d)

Pattern of the series-

$$590 - 288 = 302$$

$$302 - 144 = 158 \neq 159$$

$$158 - 72 = 86$$

$$86 - 36 = 50$$

$$50 - 18 = 32$$

$$32 - 9 = 23$$

59. (c)

Pattern of the series-

$$21.5 + 3.5 = 25 \neq 26$$

$$25 + 4.5 = 29.5$$

$$29.5 + 5.5 = 35$$

$$35 + 6.5 = 41.5$$

$$41.5 + 7.5 = 49$$

60. (c)

Pattern of the series-

$$180 + 88 = 268$$

$$268 - 40 = 228 \neq 234$$

$$228 + 88 = 316$$

$$316 - 40 = 276$$

$$276 + 88 = 364$$

61. (d)

Pattern of the series-

$$160 + 13^2 = 329$$

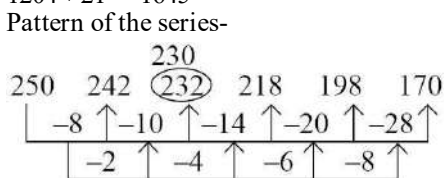
$$329 + 15^2 = 554$$

$$554 + 17^2 = 843 \neq 825$$

$$843 + 19^2 = 1204$$

$$1204 + 21^2 = 1645$$

62. (b)



63. (d)

$$\therefore a = 1$$

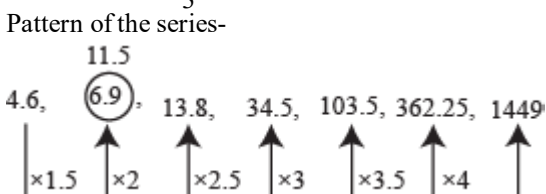
Hence, 75% of 1 = $\frac{75}{100} \times 1 = 0.75$

64. (c)

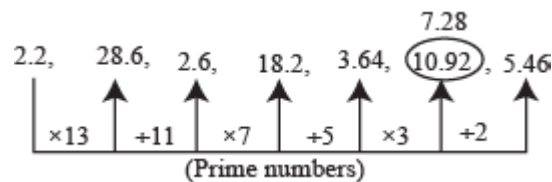
$$\frac{b}{a} = \frac{2}{3} \Rightarrow \frac{b}{1} = \frac{2}{3} \Rightarrow b = \frac{2}{3}$$

Hence 6, $b = 6 \times \frac{2}{3} = 4$

65. (b)



66. (a) Pattern of the series-



67. (a)

$$148 + 6^3 = 364$$

$$364 - 7^2 = 315$$

$$315 + 8^3 = 827$$

$$827 - 9^2 = 746$$

$$746 + 10^3 = 1746 \text{ ---A}$$

$$1746 + 11^2 = 1625$$

$$A = 1746$$

I. Nearest perfect square number of 1746 is $42^2 = 1764$

II. 1746 is not divisible by 13.

III. $A + 54 = 1746 + 54 = 1800$ is a multiple of 75.

Hence, only I and III is true.

68. (d)

For Series: I

$$2500 \times 0.8 = 2000$$

$$2000 \times 0.75 = 1500$$

$$1500 \times 0.7 = 1050$$

$$1050 \times 0.65 = 682.5 \text{ M}$$

$$682.5 \times 0.6 = 409.5$$

$$M = 682.5$$

For Series: II

$$(5 \times 2) - 2 = 8$$

$$(8 \times 3) - 3 = 21$$

$$(21 \times 4) - 4 = 80$$

$$(80 \times 5) - 5 = 395 - N$$

$$(395 \times 6) - 6 = 2364$$

$$N = 395$$

So, $M - N = 682.5 - 395 = 287.5$

69. (c)

For Series: I

$$47 + 29 \times 1 = 76$$

$$76 - 29 \times 2 = 18$$

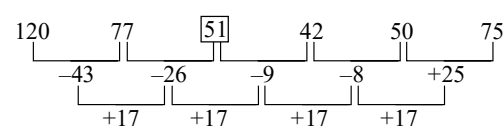
$$18 + 29 \times 3 = 105 - A$$

$$105 - 29 \times 4 = -11$$

$$-11 + 29 \times 5 = 134$$

So, the value of A is 105.

For Series II.



So, the value of B is 51.

LCM of 'A' and 'B'

Equations and Inequations

1. (c)

$$\text{Sum of roots} = \frac{-b}{a} = \frac{b}{a}$$

(coefficient of x)

$$\text{(coefficient of } x^2) \Rightarrow \frac{b}{a} = 4.5 = \frac{9}{2}$$

So, coefficient of x (M) = 9

$$\therefore \text{Equation is } -2x^2 - 9x + 10 = 0$$

$$\Rightarrow 2x^2 - 4x - 5x + 10 = 0$$

- $\Rightarrow (x-2)(2x-5)=0 \Rightarrow x=2, \frac{5}{2}=2.5$
 $\therefore a=2.5$ and $b=2$
 $4y^2 - Ny + 19 = 0$
 One root of this equation $= 2.5 \times \frac{40}{100} = 1$
 Product of roots $= c \times d = \frac{19}{4} = 4.75$
 as $c > d$
 $\therefore d=1$
 And, $c=4.75$
 I. $a+c=b+d \Rightarrow 2.5+4.75=2+1$
 $\Rightarrow 7.25 \neq 3$ (Not correct)
 II. $c+d=4.75+1=5.75$ (Correct)
 III. As, $a=2.5, b=2, c=4.75, d=1$
 So, $a > b > c > d$ is not correct
2. (b) I. $x^2 - 4x - 8x + 32 = 0$
 $\Rightarrow (x-4)(x-8)=0 \Rightarrow x=4, 8$
 II. $x^2 - 26x + 169 = 0$
 $\Rightarrow x^2 - 13x - 13x + 169 = 0$
 $\Rightarrow (x-13)(x-13)=0 \Rightarrow x=13, 13$
 So, two equations can make –
 (i) $x^2 - (13+4)x + 13 \times 4 = 0 \Rightarrow x^2 - 17x + 52 = 0$
 (ii) $x^2 - (13+8)x + 13 \times 8 = 0 \Rightarrow x^2 - 21x + 104 = 0$
 Hence, equation in option (b) is formed.
3. (b) $3x^2 - 26x + n = 0$
 sum of roots $= \frac{26}{3} \Rightarrow 1+m = \frac{26}{3} \Rightarrow 1+\frac{8}{3} = \frac{26}{3}$
 $\Rightarrow 1 = \frac{26}{3} - \frac{8}{3} = \frac{18}{3} \Rightarrow 1=6$
 Products of root $= \frac{n}{3} \Rightarrow 6 \times \frac{8}{3} = \frac{n}{3} \Rightarrow n = 48$
 I) HCF of 48 and 6 = 6
 50% more than $m = \frac{8}{3} \times \frac{150}{100} = 4$
 As $6 \neq 4$ (not true)
 II) $n = 48$ which is not perfect cube (Not true)
 III) $n = 48$ which is multiple of 1 = 6 (True)
 Hence, only III is true.
4. (e) I. $x^2 + 2x - 63 = 0$
 $x^2 + 9x - 7x - 63 = 0$
 $x(x+9) - 7(x+9) = 0$
 $(x-7)(x+9) = 0$
 $x=7$
 $x=-9$
 II. $y^2 - 2y - 24 = 0$
 $y^2 - 6y + 4y - 24 = 0$
 $y(y-6) + 4(y-6) = 0$
 $(y-6)(y+4) = 0$
 $y=6, y=-4$
 $x=y$ or relation between x and y can not be established.
5. (c) I. $x^2 - 11x + 18 = 0$
 $x^2 - 9x - 2x + 18 = 0$
 $x(x-9) - 2(x-9) = 0$
 $(x-9)(x-2) = 0$
 $x=9, x=2$

- II. $y^2 - 6y - 27 = 0$
 $y^2 - 9y + 3y - 27 = 0$
 $y(y-9) + 3(y-9) = 0$
 $(y-9)(y+3) = 0$
 $y=9, y=-3$
 Hence, $x \geq y$
6. (e) I. $x^2 - 50x + 49 = 0$
 $x^2 - 49x - x + 49 = 0$
 $x(x-49) - 1(x-49) = 0$
 $(x-1)(x-49) = 0$
 $x=1, x=49$
 II. $y^2 - 48y + 47 = 0$
 $y^2 - 47y - y + 47 = 0$
 $y^2 - 47y - y + 47 = 0$
 $y(y-47) - 1(y-47) = 0$
 $(y-1)(y-47) = 0$
 $y=1, y=47$
 Hence, $x=y$ or relationship between x and y cannot be established.
7. (a) I. $x^2 - 4x + 3 = 0$
 $x^2 - 3x - x + 3 = 0$
 $x(x-3) - 1(x-3) = 0$
 $(x-3)(x-1) = 0$
 $x=3, x=1$
 II. $y^2 + 6y + 9 = 0$
 $y^2 + 3y + 3y + 9 = 0$
 $y(y+3) + 3(y+3) = 0$
 $(y+3)(y+3) = 0$
 $y=-3, y=-3$
 Hence, $x > y$
8. (d) I. $x^2 + 3x - 18 = 0$
 $x^2 + 6x - 3x - 18 = 0$
 $x(x+6) - 3(x+6) = 0$
 $(x-3)(x+6) = 0$
 $x=3, x=-6$
 II. $y^2 - 7x + 12 = 0$
 $y^2 - 4x - 3x + 12 = 0$
 $y(y-4) - 3(y-4) = 0$
 $y=4, y=3$
 Hence, $x \leq y$
9. (b) $\left(4x^2y - \frac{5}{2}x + \frac{1}{2}y + 2^n + 1\right) + \left(-3x^2y + \frac{1}{B}x + \frac{1}{2}y - 10\right)$
 $= x^2y - Bx + y - T$
 $x^2y - \frac{5}{2}x + \frac{1}{B}x + y + 2^n + 1 - 10 = x^2y - Bx + y - T$
 $-\frac{5}{2} + \frac{1}{B} = -B, \quad 2^n + 1 - 10 = -T$
 $B + \frac{1}{B} = \frac{5}{2}, \quad 2^0 + 1 - 10 = -1$
 $-8 = -T$
 $\boxed{B=2}, \quad \boxed{T=8}$
 Now, $y=1.4$
 $x^2y - Bx + y - T = 0$
 $1.4x^2 - 2x + 1.4 - 8 = 0$
 $1.4x^2 - 2x - 6.6 = 0$

- $7x^2 - 10x - 33 = 0$
 $7x^2 - 21x + 11x - 33 = 0$
 $7x(x-3) + 11(x-3) = 0$
 $(7x+11)(x-3) = 0$
 $x \neq \frac{-11}{7}, \boxed{x=3}$
 '3' is one of the root of the equation.
10. (d) (i) B = 2, which is a prime number.
 (ii) T = 8, B is one of the factor of T.
 (iii) Product of B and 16 is $2 \times 16 = 32$
 $32 \neq 34$
 Only (i) and (ii) is correct.
11. (c) $3x^2 - 25x + 28 = 0$
 $3x^2 - 21x - 4x + 28 = 0$
 $3x(x-7) - 4(x-7) = 0$
 $(3x-4)(x-7) = 0$
 $x = 4/3, 7$
 Only II and III follows
12. (d) From equation I
 $3x^2 + x - 10 = 0$
 $3x^2 - 5x + 6x - 10 = 0$
 $x(3x-5) + 2(3x-5) = 0$
 $(3x-5)(x+2) = 0 \Rightarrow x = -2; \frac{5}{3}$
 From equation II
 $9x^2 - 31x + 12 = 0$
 $9x^2 - 27x - 4x + 12 = 0$
 $9x(x-3) - 4(x-3) = 0$
 $(9x-4)(x-3) = 0$
 $x = 4/9, 3$
 Now,
 Product of smaller roots of equation I and bigger roots of equation II $= -2 \times 3 = -6$.
13. (a) $2x - 6y = 12$
 $-2x + 3y = 24$
 $\hline +9y = +12$
 $\Rightarrow y = \frac{12}{9} = \frac{4}{3} \quad (\because 2x - 6 \times \frac{4}{3} = 12)$
 $\Rightarrow 2x = 12 + 8 = 20 \Rightarrow x = 10$
 Hence, $x > y$.
14. (e) I. $x^3 - 1728 = 0 \Rightarrow x^3 = 1728 \Rightarrow x = 12$
 II. $3y^2 - 507 = 0 \Rightarrow y^2 = 169 \Rightarrow y = \pm 13$
 Hence, relationship between X and Y can't be established.
15. (e) I. $3x^2 + 4x - 32 = 0$
 $\Rightarrow 3x^2 + 12x - 8x - 32 = 0 \Rightarrow 3x(x+4) - 8(x+4) = 0$
 $\Rightarrow (3x-8)(x+4) = 0 \Rightarrow x = \frac{8}{3}, -4$
 II. $4y^2 + 5y - 51 = 0$
 $\Rightarrow 4y^2 + 17y - 12y - 51 = 0 \Rightarrow 4y^2 - 12y + 17y - 51 = 0$
 $\Rightarrow 4y(y-3) + 17(y-3) = 0$
 $\Rightarrow (4y+17)(y-3) = 0 \Rightarrow y = 3, -\frac{17}{4}$
 Hence, relationship between X and Y can't be established.
16. (d) I. $(x+4)^2 = 0 \Rightarrow x = -4, -4$
 II. $(y-3)^2 = 0 \Rightarrow y = 3, 3$
 Hence, $x < y$.
17. (e) I. $x^2 - 14x + 8x - 112 = 0$
 $\Rightarrow (x-14)(x+8) = 0 \Rightarrow x = 14, -8$
 II. $y^2 + 8y - 5y - 40 = 0$
 $\Rightarrow (y+8)(y-5) = 0 \Rightarrow y = 5, -8$
 Hence, relation cannot be established.
18. (a) I. $x^2 - 18x + 14x - 252 = 0$
 $\Rightarrow (x-18)(x+14) = 0 \Rightarrow x = 18, -14$
 II. $y^2 - 8y + 6y - 48 = 0$
 $\Rightarrow (y-8)(y+6) = 0 \Rightarrow y = 8, -6$
 Hence, the relation cannot be established.
19. (e) I. $2x^2 - 8x + 13x - 52 = 0$
 $\Rightarrow (x-4)(2x+13) = 0 \Rightarrow x = 4, \frac{-13}{2}$
 II. $2y^2 - 6y + 15y - 45 = 0$
 $\Rightarrow (y-3)(2y+15) = 0 \Rightarrow y = 3, \frac{-15}{2}$
 Hence, the relation can not be established.
20. (a) I. $7x^2 + 14x + 4x + 8 = 0$
 $\Rightarrow (x+2)(7x+4) = 0 \Rightarrow x = -2, \frac{-7}{4}$
 II. $9y^2 - 12y - 3y + 4 = 0$
 $\Rightarrow (3y-4)(3y-1) = 0 \Rightarrow y = \frac{4}{3}, \frac{1}{3}$
 Hence, $x < y$.
21. (d) (i) $3x^2 - 10x + 8 = 0$
 $3x^2 - 6x - 4x + 8 = 0$
 $3x(x-2) - 4(x-2) = 0$
 $(3x-4)(x-2) = 0$
 $x = \frac{4}{3}, 2$
 (ii) $2y^2 - 9y + 10 = 0$
 $2y^2 - 4y - 5y + 10 = 0$
 $2y(y-2) - 5(y-2) = 0$
 $(2y-5)(y-2) = 0; y = \frac{5}{2}, 2$
 Hence, $x \leq y$
22. (c) (i) $2x^2 - 9x + 9 = 0$
 $2x^2 - 6x - 3x + 9 = 0$
 $2x(x-3) - 3(x-3) = 0$
 $(2x-3)(x-3) = 0; x = \frac{3}{2}, 3$
 (ii) $2y^2 - 7y + 6 = 0$
 $2y^2 - 4y - 3y + 6 = 0$
 $2y(y-2) - 3(y-2) = 0$
 $(2y-3)(y-2) = 0; y = \frac{3}{2}, 2$
 Hence, $x \geq y$
23. (a) Put $x = 5$ in equation P.
 $(5-2)^2 = (-3 \times 5^2) + 2^2 + 25 \times 5 - A$

$$9 = -75 + 4 + 125 - A$$

$$A = 54 - 9$$

$$\boxed{A = 45}$$

$$7A \div 21 \times 0.2A - 89 = \frac{7 \times 45}{21} \times \frac{2}{10} \times 45 - 89$$

$$= 15 \times \frac{2}{10} \times 45 - 89 = 135 - 89 = 46$$

$$A + 1 = 45 + 1 = 46$$

24. (b) $(x - 2)^2 = (-3x^2) + 2^2 + 25x - 45 \{A = 45\}$

$$x^2 + 4 - 4x = -3x^2 + 4 + 25x - 45$$

$$4x^2 - 29x + 45 = 0$$

$$4x^2 - 20x - 9x + 45 = 0$$

$$4x(x - 5) - 9(x - 5) = 0$$

$$(4x - 9)(x - 5) = 0$$

$$x = \frac{9}{4}, x = 5$$

Largest one digit prime number = 7

$$\frac{9}{4} \times 7 = \frac{63}{4} = 15\frac{3}{4}$$

25. (d) $\left(10y^2 - 3^2y + \frac{2}{3}\right)(3) + 10y = 0$

$$30y^2 - 27y + 2 + 10y = 0$$

$$30y^2 - 17y + 2 = 0$$

$$30y^2 - 12y - 5y + 2 = 0$$

$$6y(5y - 2) - 1(5y - 2) = 0$$

$$(6y - 1)(5y - 2) = 0$$

$$y = \frac{1}{6}, y = \frac{2}{5}$$

26. (a) As, one of the roots is -10.
So $y = -10, mn = 30$

$$\sqrt{(-10 + 45 - 30)^4} = 5y + Q$$

$$5^2 = -50 + Q$$

$$\boxed{Q = 75}$$

Quantity 1 :

$$(75)^{\frac{4}{5}} = 25^{\frac{4}{5}} \times 3^{\frac{4}{5}} = 5^{1.6} \times 3^{0.8} = 13.13 \times 2.4 = 31.51$$

Quantity 2: $\frac{75}{4} = 18.75$

Quantity 1 > Quantity 2

27. (a) $6x^2 + 13x + 6 = 0 \Rightarrow 6x^2 + 9x + 4x + 6 = 0$

$$\Rightarrow 3x(2x + 3) + 2(2x + 3) = 0$$

$$\Rightarrow (3x + 2)(2x + 3) = 0$$

$$\Rightarrow x = \frac{-3}{2}, \frac{-2}{3} \text{ (Highest root)}$$

$$\text{Hence, } (125)^{-2/3} = \frac{1}{\left[(125)^{1/3}\right]^2} = \frac{1}{5^2} = \frac{1}{25}$$

28. (c) (i) $x^2 - \frac{11x}{2} + \frac{15}{2} = 0$

$$\Rightarrow 2x^2 - 11x + 15 = 0 \Rightarrow 2x^2 - 6x - 5x + 15 = 0$$

$$\Rightarrow 2x(x - 3) - 5(x - 3) = 0$$

$$\Rightarrow (2x - 5)(x - 3) = 0 \Rightarrow x = \frac{5}{2}, 3$$

(ii) $y^2 - 2y + 1.75 = 2y - 2$

$$\Rightarrow y^2 - 4y + 3.75 = 0 \Rightarrow 4y^2 - 16y + 15 = 0$$

$$\Rightarrow 4y^2 - 10y - 6y + 15 = 0$$

$$\Rightarrow 2y(2y - 5) - 3(2y - 5) = 0$$

$$\Rightarrow (2y - 3)(2y - 5) = 0 \Rightarrow y = \frac{3}{2}, \frac{5}{2}$$

Hence, $x \geq y$

29. (e) (i) $x^2 - 3\sqrt{7}x - \sqrt{7}x + 21 = 0$

$$\Rightarrow x(x - 3\sqrt{7}) - \sqrt{7}(x - 3\sqrt{7}) = 0$$

$$\Rightarrow (x - \sqrt{7})(x - 3\sqrt{7}) = 0 \Rightarrow x = \sqrt{7}, 3\sqrt{7}$$

(ii) $2y^2 - 10\sqrt{5}y + 2\sqrt{5}y - 50 = 0$

$$\Rightarrow 2y(y - 5\sqrt{5}) + 2\sqrt{5}(y - 5\sqrt{5}) = 0$$

$$\Rightarrow (2y + 2\sqrt{5})(y - 5\sqrt{5}) = 0$$

$$\Rightarrow y = -\sqrt{5}, 5\sqrt{5}$$

Hence, no relationship could be established.

30. (a) (i) $x^2 - 35\sqrt{2}x - 2\sqrt{2}x + 140 = 0$

$$\Rightarrow (x - 35\sqrt{2})(x - 2\sqrt{2}) = 0 \Rightarrow x = 2\sqrt{2}, 35\sqrt{2}$$

(ii) $y^2 + 8\sqrt{3}y + 5\sqrt{3}y + 120 = 0$

$$\Rightarrow (y + 8\sqrt{3})(y + 5\sqrt{3}) = 0 \Rightarrow y = -5\sqrt{3}, -8\sqrt{3}$$

Hence, $x > y$

31. (e) I. $3x(x - 12) + 72 = x^2 - 11x - 5$

$$3x^2 - 36x + 72 = x^2 - 11x - 5$$

$$2x^2 - 25x + 77 = 0$$

$$2x^2 - 14x - 11x + 77 = 0$$

$$2x(x - 7) - 11(x - 7) = 0$$

$$(2x - 11)(x - 7) = 0$$

$$x = \frac{11}{2}, x = 7$$

II. $5y(y - 3) - 64 = y(3y - 2) - 19$

$$5y^2 - 15y - 64 = 3y^2 - 2y - 19$$

$$2y^2 - 13y - 45 = 0$$

$$2y^2 - 18y + 5y - 45 = 0$$

$$2y(y - 9) + 5(y - 9) = 0$$

$$(y - 9)(2y + 5) = 0$$

$$y = 9, y = \frac{-5}{2}$$

III. $(m + 2a - d)^2 = 169$

$$(m + 2 \times \frac{11}{2} - 9)^2 = 169$$

$$\begin{aligned}(m+11-9)^2 &= 169 \\ m+2 &= 13, m+2 = -13 \\ m &= 11, m = -15 \\ \text{Therefore, } n &\geq m\end{aligned}$$

32. (b)

$$\begin{aligned}\text{I. } 2x^2 - 6(x+4) &= 3x+11 \\ 2x^2 - 6x - 24 &= 3x+11 \\ 2x^2 - 9x - 35 &= 0 \\ 2x^2 - 14x + 5x - 35 &= 0 \\ 2x(x-7) + 5(x-7) &= 0 \\ (2x+5)(x-7) &= 0\end{aligned}$$

$$x = \frac{-5}{2}, x = 7$$

$$\begin{aligned}\text{II. } 2y^2 - 12(y-4) &= 7y+6 \\ 2y^2 - 12y + 48 &= 7y+6 \\ 2y^2 - 19y + 42 &= 0 \\ 2y^2 - 12y - 7y + 42 &= 0 \\ 2y(y-6) - 7(y-6) &= 0 \\ (2y-7)(y-6) &= 0\end{aligned}$$

$$y = \frac{7}{2}, y = 6$$

$$\text{III. } \frac{15c}{2} - 8b = 9a - 4d + T^2$$

$$\frac{15 \times 6}{2} - 8\left(\frac{-5}{2}\right) = 9 \times 7 - 4 \times \frac{7}{2} + T^2$$

$$45 + 20 = 63 - 14 + T^2$$

$$65 - 63 + 14 = T^2$$

$$\boxed{T = \pm 4}$$

Number System, Average & Age

- (c) The total weight of all staff members = $15 \times 40 = 600$ kg
When one staff member leaves, the total weight of the remaining 14 staff members is = $14 \times 39 = 546$ kg
Weight of leaving member = $600 - 546 = 54$ kg
When one staff member joins, the total weight of the 15 staff members is = $15 \times 42 = 630$ kg
weight of new joining staff member = $630 - 546 = 84$ kg
Difference between the weight of the staff member who left the office and who join the office = $84 - 54 = 30$ kg
- (b) The ratio of present age of A, B and C = $6 : 2 : 5$
The difference between the present age of A and C is 4 years.
The age of A = $6 \times 4 = 24$ years
The age of C = $5 \times 4 = 20$ years
The sum of their ages = $24 + 20 + 10 + 10 = 64$ years
- (b) Let J's present age is x years.
According to question,
$$\frac{x-2}{x+10} = \frac{4}{7}$$

$$\Rightarrow 7x - 14 = 4x + 40 \Rightarrow 3x = 54 \Rightarrow x = 18$$
 years
Let K's present age is y years.
 $18 - y = 72 - 12a$
$$\Rightarrow y = 12a - 54 \text{ --- (i)}$$

$$\begin{aligned}\text{And } 18 + y &= a^2 \\ \Rightarrow y &= a^2 - 18 \text{ --- (ii)} \\ \text{From equation (i) and (ii) -} \\ 12a - 54 &= a^2 - 18\end{aligned}$$

$$\Rightarrow a^2 - 12a + 36 = 0 \Rightarrow a = 6$$

$$\therefore \text{K's present age} = 12 \times 6 - 54 = 18 \text{ years.}$$

$$\text{So average age} = \frac{(18+3) + (18-7)}{2} = \frac{21+11}{2} = 16$$

$$\text{Hence, we can write } 16 = 6 + 10 = (a + 10)$$

$$\begin{aligned}\text{4. (b) (J+K+L+M)'s weight} &= 4a \quad \dots\text{(i)} \\ \text{(J+K+L+N)'s weight} &= 4 \times (a + 14.25) \\ &= 4a + 57 \quad \dots\text{(ii)}\end{aligned}$$

$$\text{From equ (i) and (ii)}$$

$$4a - M + N = 4a + 57$$

$$\Rightarrow N - M = 57 \quad \dots\text{(iii)}$$

$$\text{And, } J + K + N + M = 4(a + 6.75) = 4a + 27 \quad \dots\text{(iv)}$$

$$\text{From equ (i) and (iv)}$$

$$4a - L + N = 4a + 27$$

$$\Rightarrow N - L = 27 \quad \dots\text{(v)}$$

$$\text{And, } L + M + N = 74 \times 3 = 222$$

$$\Rightarrow N - 27 + N - 57 + N = 222$$

$$\Rightarrow 3N = 222 + 84 = 306 \Rightarrow N = 102$$

$$\therefore L = 102 - 27 = 75$$

$$\text{Hence, required percentage} = \frac{(102 - 75)}{75} \times 100$$

$$= \frac{27}{3} \times 4 = 36\%$$

- (d) Let the number of girls = $3x$
The number of boys = $2x$
Total marks obtained by the girls = $3x \times 90 = 270x$.
Total marks obtained by the whole class = $5x \times 92 = 460x$
Total marks obtained by the boys = $460x - 270x = 190x$

The average marks scored by the boys = $\frac{190x}{2x} = 95$
- (b) Let present age of Lavi and Vinu are x and y years respectively.
According to question,
$$\frac{x-5}{y} = \frac{4}{5} \Rightarrow 5x - 25 = 4y$$

$$\Rightarrow 5x - 4y = 25 \quad \dots\text{(i)}$$

And,
$$\frac{x+7}{y+7} = \frac{4}{3}$$

$$\Rightarrow 3x + 21 = 4y + 28$$

$$\Rightarrow 3x - 4y = 28 - 21 = 7 \quad \dots\text{(ii)}$$

By solving equ. (i) and (ii)
 $x = 9$ and $y = 5$
Hence, age of Vinu after 10 years = $5 + 10 = 15$ years
- (c) Sum of present age of Ali and Peter = $36 \times 2 = 72$ years.
Let present age of John = m year
Then, Ali age after 5 years = $(m - 5)$
$$\therefore \text{Ali's present age} = (m - 5 - 5) = (m - 10)$$

- and Peter's present age = $72 - (m - 10) = (82 - m)$
 Now, 8 years before, ratio of ages of
- $$\frac{\text{John}}{\text{Peter}} = \frac{5}{6} \Rightarrow \frac{(m - 8)}{\{(82 - m) - 8\}} = \frac{5}{6}$$
- $$\Rightarrow 6m - 48 = 410 - 5m - 40$$
- $$\therefore 11m = 418 \Rightarrow m = \frac{418}{11} = 38 \text{ Years}$$
8. (a) Let 3 consecutive odd numbers = $x - 2$,
 x and $x + 2$
 and consecutive even numbers = $y - 2$, y , $y + 2$
 So, $y - 2 = 9 + x + 2$
 $y - x = 13$... (i)
 and
 $(x)^2 + 507 = (y)^2$
 $y^2 - x^2 = 507$
 $(x + y)(y - x) = 507$
 $(x + y) = \frac{507}{13} \Rightarrow x + y = 39$... (ii)
 Solving (i) and (ii) $y = 26$ and $x = 13$
 so smallest odd number = $x - 2$
 $= 13 - 2 = 11$
9. (c) Sum of the height of 20 employee = $1.5 \times 20 = 30$ m
 For the average in month of June,
 Number of people available = $20 - 2 = 18$
 Sum of the height of 18 people = $30 - 1.4 - 1.6 = 27$ m
 Average height = $27/18 = 1.5$ m
 For the average in month of September,
 Number of people available = $18 - 2 + 1 = 17$
 Sum of height of two person who left the company =
 $1.7 \times 2 = 3.4$ m
 Height of person who join the company = 87.5% of
 height of Khali = $(7/8) \times 1.6 = 1.4$ m
 Sum of the height of 17 people = $27 - 3.4 + 1.4 = 25$ m
 \therefore Average of height in the month of September = $25/17$
 $= 1.47$ m
10. (a) According to question,

$$\frac{8A + 151}{10} = A + 1.5$$

$$\Rightarrow 8A + 151 = 10A + 15$$

$$\Rightarrow 2A = 136$$

$$\Rightarrow A = 68 \text{ kg}$$

$$\therefore \text{Weight of lights new employee} = 68 - 5 = 63 \text{ kg}$$

$$\therefore \text{Weight of another new employee} = 151 - 63 = 88 \text{ kg}$$
 Hence, difference between the weights of two new employees = $88 - 63 = 25$ kg
11. (b) Let consecutive multiples of 4 are
 $= 4x, 4(x + 1), 4(x + 2)$ and $4(x + 3)$
 According to question,
 $4x + 4x + 4 + 4x + 8 + 4x + 12 = 184$
 $\Rightarrow 16x + 24 = 184$
 $\Rightarrow 16x = 160$
 $\Rightarrow x = 10$
 Hence, smallest multiple is $= 4 \times 10 = 40$
12. (b) Total ages of J, K and $L = 3 \times 14 = 42$ years
 Total age of K, L and $M = 15 \times 3 + 4 \times 3 = 57$ years
 $\therefore M - J = 15$... (i)
 and $M + J = 27$... (ii)

- By solving eq. (i) and (ii)
 $M = 21$ years and $J = 6$ years
 Hence, age of M 5 years hence, $21 + 5 = 26$ years
13. (d) Sum of three even numbers = $3 \times 42 = 126$
 \therefore Shortest even number = $126 - 2 \times 45 = 36$
 Sum of three odd numbers = $3 \times 39 = 117$
 \therefore Shortest odd number = $117 - 2 \times 44 = 29$
 Hence, sum of two shortest numbers = $36 + 29 = 65$
14. (d) Set X:
 $a - 4, a - 2, a, a + 2, a + 4$
 So, $\frac{a - 2 + a + 4}{2} = 385$
 $\Rightarrow a + 1 = 385 \Rightarrow \boxed{a = 384}$
 So, numbers in Set X : 380, 382, 384, 386, 388
 Set Y :
 $b - 4, b - 2, b, b + 2, b + 4$
 So, $\frac{b - 4 + b + 2}{2} = 380 - 30$
 $\Rightarrow b - 1 = 350$
 $\Rightarrow \boxed{b = 351}$
 So, numbers in Set Y : 347, 349, 351, 353, 355
 Set Z:
 $C, C + 1, C + 2, C + 3$,
 So, $C + 1 = 347 - 6$
 $\Rightarrow C = 340$
 So, numbers in set Z: 340, 341, 342, 343
 Hence 1st number of set Z is 340.
15. (d) Let present age of J and K are $4x$ and $5x$ years respectively.
 According to question,

$$4x + 2 = \frac{13}{11}(5x - 8)$$

$$\Rightarrow 44x + 22 = 65x - 104 \Rightarrow 21x = 126 \Rightarrow x = \frac{126}{21} = 6$$
 Hence, present age of $J = 4 \times 6 = 24$ years
16. (b) Let the four consecutive odd numbers are $a, (a + 2), (a + 4)$ and $(a + 6)$
 So, $\frac{a + a + 6}{2} = 12 \Rightarrow a + 3 = 12 \Rightarrow a = 9$
 \therefore Numbers = 9, 11, 13, 15
 Hence, difference between second and third number = $13 - 11 = 2$
17. (d) Lowest number of set A = $\frac{280}{5} - 4 = 52$
 Lowest number of other set = $52 \times 2 - 71 = 33$
 \therefore Required sum = $33 + 34 + 35 + 36 + 37 = 175$
18. (e) According to the question
 Present age of Parineeta = $33 - 9 = 24$ years
 Present age of Manisha = $24 - 9 = 15$ years
 Present age of Deepali = $24 + 15 = 39$ years
 $\therefore 5 : X = 15 : 39$
 $\therefore X = \frac{5 \times 39}{15} = 13$