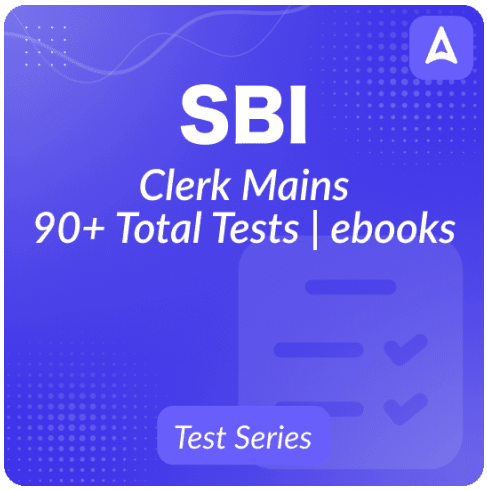
100 Important Questions for SBI Clerk Mains 2024 Quantitative Aptitude

Q1. There were two solid spherical balls. The ratio between radius of first ball to that of second ball is 4 : 3. The second ball was cut into two equal halves and the difference between total surface area of first ball and total surface area of a part of second ball is 1424.5 cm^2. Find value of radius of bigger ball?

(a) 14 cm
(b) 16 cm
(c) 10.5 cm
(d) 20 cm
(e) 28 cm

Q2. Pipe P alone & Pipe Q alone can fill same tank in 24 hours and in 15 hours respectively and another pipe R alone can empty same tank in 20 hours. If pipe P, Q & R are opened alternatively for an hour to fill the same tank in such a way that pipe Q opened in 1st hour and then pipe R (outlet) and then pipe P, then find time taken to fill the tank?

(a) $51\frac{1}{8}$ hours
(b) 52 hours
(c) $50\frac{3}{8}$ hours
(d) $51\frac{1}{5}$ hours
(e) 49 hours



Q3. Maanik and Shivam entered into a partnership by investing Rs.20000 and Rs.32000 respectively. After 4 months, Maanik increased his investment by 50% and after another 6 months Shivam increased his investment by 25%. If at the end of the year Shivam got a profit of Rs.30000, then find total profit?

(a) Rs.80000
(b) Rs.77000
(c) Rs.54000
(d) Rs.93000
(e) Rs.12000

Q4. Deepak invested Rs. P for 2 years in scheme A at the rate of 18% p.a. on compound annually and received a total amount of Rs.83544 from scheme A. He then invested Rs. (P+X) in another scheme B for 2 years at the rate 20% p.a. on simple interest. If he received Rs.30000 as interest from scheme B, then find X?

(a) Rs 24000
(b) Rs 28000
(c) Rs 12000
(d) Rs 22000
(e) Rs 15000

Q5. The cost price of 2 bats is equal to the cost price of 6 balls. If ratio of number of bats to that of balls sold by shopkeeper is 2 : 3 and bats are sold at 40% profit and balls are sold at 50% profit, then what is the overall profit percentage of shopkeeper.

(a) $76\frac{2}{3}\%$
(b) $38\frac{1}{3}\%$
(c) $59\frac{2}{3}\%$
(d) $43\frac{1}{3}\%$
(e) $22\frac{2}{3}\%$

Directions (6-10): Read the given information carefully and answer the questions that follows. Table shows the three types of waves (in percentage) which together constitutes 35% of the sun rays received in a minute and the paragraph gives the information about remaining of the sun rays received in that minute. Total units of sun rays received in 1 minute= 3600 units.

Types of waves	Radio waves	Alpha waves	Micro waves
Units(in%)	$34\frac{2}{7}\%$	$22\frac{6}{7}\%$	$42\frac{6}{7}\%$

There are five types of rays i.e. IR rays, UV rays, Gamma rays, X rays and β rays. Ratio of units of Gamma rays received to UV rays received is 2: 3. Units of X rays received is 100% more than units of IR rays received. The amount by which Gamma rays is more than that of IR rays is 25% of the Alpha rays received in that minute. β rays received is 50% of the IR rays received.

Q6. If the human body can withstand a maximum 8748 units of IR rays when exposed to the sun continuously, then what is the maximum amount of time that a person can stand in the sun without crossing the threshold limit of IR rays?
(a) 22.3 min
(b) $23\frac{1}{3}$ min
(c) 24.3 min
(d) 25.23 min
(e) 25.33 min

Q7. The amount of UV rays received in 5 mins is how many times the amount of IR rays received in 2 mins?
(a) 4.25 times
(b) 4.15 times
(c) 4.5 times
(d) 4.75 times
(e) None of these

Q8. If 3600 units of sun rays received in one minute were after the reflections of 55% of the sun rays by the ozone layers. What would be the amount of Gamma rays received in one minute, if the ozone layer were to disappear completely?
(a) 960 units
(b) 1050 units
(c) 920 units
(d) 880 units
(e) 900 units

Q9. The amount of Micro waves received in 5 minutes is how much more/less than the amount of Alpha waves received in 4 minutes?
(a) 1538 units
(b) 1544 units
(c) 1536 units
(d) 1542 units
(e) 1548 units

Q10. How many minutes of exposure to the sun in a day would be enough to ensure that the body receives enough amount of vitamin D, given that the body requires 40 units of vitamin D every day and that 30 units of β rays generate 1 unit of vitamin D?
(a) $7\frac{1}{2}$ min
(b) $8\frac{1}{3}$ min
(c) 5 min
(d) $6\frac{2}{3}$ min
(e) $6\frac{1}{4}$ min

Directions (11-15): Given below are the two series in which first series is correct and follows some pattern. Based on the pattern followed in first series find the value of E in each question.

Q11. 2 1.5 2.5 7 32 264 4240
9 B C D E F
(a) 40
(b) 364
(c) 486
(d) 284
(e) 60

Q12. 2 3 11 38 102 227 443
12 B C D E F
(a) 120
(b) 254
(c) 468
(d) 112
(e) 156

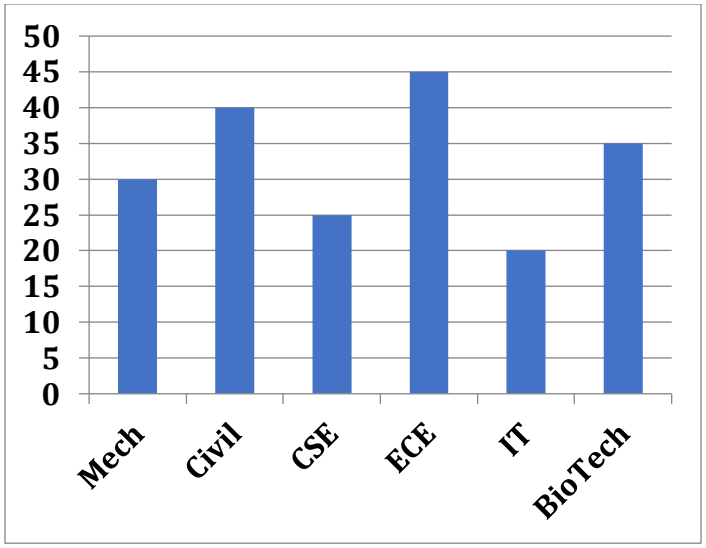
Q13. 1240, 1492, 1756, 2032, 2320, 2620
(2328), (B), (C), (D), (E)
(a) 8340
(b) 2538
(c) 5204
(d) 2650
(e) 3408

Q14. 3756, 3763, 3749, 3777, 3721, 3833
(3760) , (B) , (C) , (D) , (E)
(a) 3725
(b) 3526
(c) 3628
(d) 3927
(e) 4272

Q15. 1256, 1256, 1260, 1278, 1326, 1426
(1258) , (B) , (C) , (D) , (E)
(a) 1762
(b) 1544
(c) 1328
(d) 1620
(e) 1840

Directions (16-20): Table given below shows total number of students in different streams of engineering in a college and bar graph shows number of boys more than number of girls in terms of percentage in each stream. Study the data carefully and answer the following question.

	Total students
Mech	805
Civil	672
CSE	900
ECE	784
IT	990
BioTech	705



Note: - Number of boys is always greater than number of girls in each stream.

Q16. Number of boys in Mech. stream is how much more than number of girls in IT stream?
(a) 10
(b) 3
(c) 12
(d) 5
(e) 8

Q17. Find the average number of girls in Civil, CSE and ECE streams together?
(a) $\frac{1000}{3}$
(b) 330
(c) 320
(d) 280
(e) 315

Q18. Boys and Girls who scored more than 8 CGPA in Biotech are 40% and 60% of their respective number in that stream. Then number of girls in Biotech not scoring more than 8 CGPA is what percent of boys scoring more than 8 CGPA in Biotech?
(a) $72\frac{2}{9}\%$
(b) $73\frac{4}{27}\%$
(c) 75%
(d) $74\frac{2}{27}\%$
(e) $71\frac{8}{27}\%$

Q19. 75% and 60% of the students of CSE and IT streams are got placed in TCS which is 75% of the total students got placed in TCS from that college. Number of girls from CSE and IT who got placed in TCS is 350 and 30% of total students in that stream respectively. Then number of boys from these two streams placed in TCS is what part of total number of placed students in TCS?

(a) $\frac{299}{846}$
(b) $\frac{311}{846}$
(c) $\frac{28}{141}$
(d) $\frac{160}{423}$
(e) $\frac{170}{423}$

Q20. Number of girls in Mech. is what percent more than number of girls in Civil?

(a) 30%
(b) 25%
(c) 35%
(d) 45%
(e) 55%

Q21. Amar invested a sum of Rs 2000 in a business with Akbar who invested Rs 'X'. After 4 months, Anthony joined them with Rs '2X'. After another 4 months, Amar withdrew half of his investment while Anthony invested Rs 'X+1000' more. At the end of the year, Akbar got Rs 18000 out of total profit of Rs 60000. If Amar & Akbar re-entered into another partnership with Rs 'X+2000' & Rs 'X-1000' respectively then find profit ratio at end of year.

(a) 3 : 2
(b) 5 : 2
(c) 5 : 4
(d) 4 : 1
(e) None of these

Q22. A tank can be filled by 3 pipes A, B, C in 2, x, y hours respectively. Efficiency of filling pipes is same as that of emptying. Time taken by A (inlet) & C (outlet) to fill the tank is $66\frac{2}{3}$% less than time taken by B (inlet) & C (outlet). If A, B act as outlet then the tank gets emptied in 72 minutes. Find time taken by B & C both as inlet to fill the tank.

(a) $3\frac{1}{3}$ hours
(b) $1\frac{3}{7}$ hours
(c) $1\frac{1}{5}$ hours
(d) $2\frac{5}{7}$ hours
(e) $1\frac{5}{7}$ hours

Q23. Inside a square plot a circular garden is developed which exactly fits in the square plot and the diameter of the garden is equal to the side of the square plot which is 28 meters. What is the area of the space left out in the square plot after developing the garden?

(a) 98 m^2
(b) 146 m^2
(c) 84 m^2
(d) 168 m^2
(e) 68 m^2

Q24. Time taken by a boat to cover 'D' km upstream is 5 hours while the boat covers 'D+5' km downstream in 3 hours. The boat takes 12 hours to cover 'D+10' km downstream & return '2D – 4' km upstream. Find speed of boat in still water.

(a) 4 kmph
(b) 3.5 kmph
(c) 5 kmph
(d) 3 kmph
(e) 2.5 kmph

Q25. Akshay invested Rs 'P' in a scheme offering 20% simple interest for '2T' years. After completion of period, he invested only the sum in another scheme offering compound interest at 10% p.a. for three years if at the end of the period, interest obtained from the scheme is twice the interest obtained from first scheme. Which of the following is absolutely true?

(a) $0.367 < T < 0.44$
(b) $0.314 < 2T < 0.45$
(c) $0.2 < T < 0.35$
(d) $0.4 < 2T < 0.56$
(e) $0.68 < 2T < 0.82$

Directions (26-28): The following questions are accompanied by two statements (I) and (II). You have to determine which statements(s) is/are sufficient/necessary to answer the questions.

(a) Statement (I) alone is sufficient to answer the question but statement (II) alone is not sufficient to answer the question.

(b) Statement (II) alone is sufficient to answer the question but statement (I) alone is not sufficient to answer the question.

(c) Both the statements taken together are necessary to answer the question, but neither of the statements alone is sufficient to answer the question.

(d) Either statement (I) or statement (II) by itself is sufficient to answer the question.

(e) Statements (I) and (II) taken together are not sufficient to answer the question.

Q26. There are three articles A, B and C. Find the cost price of article B?

I. Marked price of B & C is same. Shopkeeper allowed 10% discount on C and cost price of C is Rs.250. Ratio of profit earned to discount allowed on B & C is 3 : 5 and 2 : 3 respectively.

II. Ratio of cost price of A to that of B is 8 : 3. Shopkeeper incurred a loss of 12.5% on A and selling price of A is Rs.195 more than selling price of B.

Q27. A man invested Rs.5P, Rs.7P and Rs.4P in schemes A, B & C respectively. Schemes – A & C offers CI and scheme B offers SI. Find value of P.

I. Ratio of period of investment in scheme A and B is 2 : 3 and rate of interest offered by scheme A is 2% more than that offered by scheme B. Total interest received by the man from schemes A & B together is Rs.2,32,704.

II. Amount received from scheme B is Rs.1,66,860 more than that received from scheme C. Rate of interest offered by scheme C is 15% p.a. and period of investment in scheme B is thrice of period of investment in scheme C.

Q28. In a box three types of balls are there Black, Red and White. If number of white balls is given, then find out the probability of getting one white ball.

I. Probability of getting one red ball is given.

II. Probability of getting one black ball is given.

Directions (29-30): Each of the following question is followed by two quantities I, and II. You have to determine the value of the quantities using the information provided and accordingly compare the quantities. Mark your answer as per the instruction set provided below.

(a) Quantity I>Quantity II

(b) Quantity I≥Quantity II

(c) Quantity I<Quantity II

(d) Quantity I≤Quantity II

(e) Quantity I=Quantity II or no relation

Q29. Quantity I: Time taken by Prabhas to cover a distance of 200 km (without stoppage) by car through which he covers a distance of 100 km in 1 hour when he stops to get fuel for 10 minutes.

Quantity II: Time taken by Nagarjuna to travel 20 km downstream if speed of boat and speed of stream be 7 kmph & 3 kmph respectively.

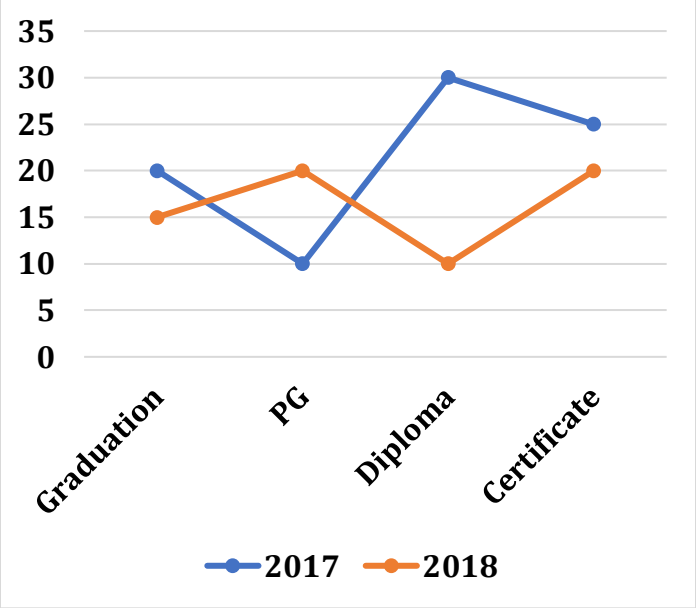
Q30. $\frac{1}{a}+\frac{1}{b}$ =?

Quantity I: a & b are roots of equation $x^2+x-6=0$

Quantity II: $a^2+b^2=20; ab=8$

Directions (31-35): Given line graph shows the percentage hike in fees for first year only of four courses over two years as compared to their immediate previous year. Read the data carefully and answer the questions.

(**NOTE**: fees percentage is for the course starting in the respective year e.g. if Rs X was fees for any course in 2017 and it becomes Rs 1.2X in 2018 then this is fees for first year of that course only. Thereafter increase/decrease will be followed as per data provided in the question)



Q31. If ratio of fees of graduation in 2017 to fees of certificate course in 2018 is 4 : 1 then by what percent fees of graduation in 2016 is more/less than total fees of certificate course in 2016, 2017 & 2018 together?

(a) $73\frac{1}{3}\%$

(b) 20%

(c) $66\frac{2}{3}\%$

(d) 25%

(e) $33\frac{1}{3}\%$

Q32. If difference between fees of PG course in 2017 & 2018 together and fees of diploma course in 2017 & 2018 together is equal to sum of fees of PG course & diploma together in 2016 then what is ratio of average fees of PG in all three years to that of diploma in all three years?

(a) 373 : 273

(b) 171 : 71

(c) 342 : 373

(d) 373 : 171

(e) 273 : 242

Q33. Fees of Graduation course in 2018 is Rs 276000 per year. A student joined in 2016. Annual fees increase by 10% every year. Find total fees paid by the student if duration of Graduation course is 4 years.

(a) Rs 988200

(b) Rs 872000

(c) Rs 100000

(d) Rs 928200

(e) Rs 800000

Q34. In 2018, total Rs 5.72 cr was collected from 200 students who joined diploma course that year. Find difference between per head fees of diploma course in 2017 and 2016.

(a) Rs 60000

(b) Rs 55000

(c) Rs 64000

(d) Rs 58000

(e) Rs 62000

Q35. If average fees of PG in 2017 & 2018 is equal to average fees of certificate course over 2016, 2017 & 2018, then by what percent fees of certificate course in 2016 is more/less than that of PG in 2016?

(a) None of these

(b) 3.5%

(c) 3.2%

(d) 7.2%

(e) 5.5%

Q36. Prem gets an aggregate of 70% marks in five subjects in ratio 9 : 8 : 7 : 6 : 5. Maximum marks of each subject is same and 55% of maximum is needed to pass each exam. Then, in how many subjects did he pass the examination?

(a) 3

(b) 2

(c) 5

(d) 1

(e) 4

Q37. The average price of a TV, washing machine & refrigerator is Rs 5000 less than average price of TV & washing machine. The amount by which the price of TV is more than that of washing machine is same as amount by which price of refrigerator is less than that of washing machine. Find difference between average price of TV & washing machine & average price of washing machine & refrigerator.

(a) Rs 10000
(b) Rs 30000
(c) Rs 5000
(d) Cannot be determined
(e) None of these

Q38. A box contains 8 red, 4 green & 5 pink gems. A table top is to be decorated with 10 gems. What is the probability that the decoration contains at least 5 red & 3 pink gems and also all three colored gems are there?

(a) $\frac{560}{2431}$
(b) $\frac{280}{2431}$
(c) $\frac{140}{2431}$
(d) $\frac{700}{2431}$
(e) $\frac{420}{2431}$

Q39. A man can cover a distance of 20 km in 't' hours. One day after covering half distance, he stuck in a traffic jam in which 10 minutes got wasted. Now to reach the place 20 minutes earlier than his usual time, by what percent should he increase his speed?

(a) 33.33%
(b) 25%
(c) 20%
(d) Cannot be determined
(e) 37.5%

Q40. Two students Ayush and Atul participated in college election for president post. Ayush, the losing candidate gets 'X' number of votes which was exactly 40% of all casted votes. What percent of the remaining votes would he need to have received in order to have atleast 50% of the total casted votes?

(i) $16\frac{2}{3}\%$
(ii) 12.5%
(iii) 20%
(iv) 15%
(v) 10%
(a) Only (i)
(b) Only (ii)and (iv)
(c) Only (i) and (iii)
(d) Only (iii) and (v)
(e) Only (i),(ii) and (iii)

Directions (41-43): In the following questions, a series is given in which one term is wrong with which another series started. You have to find the wrong term in the given series then starting from that, find 5th term of new series so formed.

Example: 1, 2, 5, 21, 88, 445, 2676
Pattern of above series –
$1 \times 1 + 1 = 2$
$2 \times 2 + 2 = 6$
$6 \times 3 + 3 = 21$
$21 \times 4 + 4 = 88$
$88 \times 5 + 5 = 445$
$445 \times 6 + 6 = 2676$
So, wrong number = 5
Now new series start with wrong number, which is 5
So, new series
$5 \times 1 + 1 = 6$
$6 \times 2 + 2 = 14$
$14 \times 3 + 3 = 45$
$45 \times 4 + 4 = 184$
$184 \times 5 + 5 = 925$
$925 \times 6 + 6 = 5556$
So, 5th term of new series = 184

Q41. 3, 2, 6, 15, 60, 315, 1896
(a) 59
(b) 42816
(c) 7135
(d) 357
(e) 1432

Q42. 993, 850, 750, 688, 653, 638, 635
(a) 410
(b) 445
(c) 395
(d) 392
(e) 508

Q43. 20, 30, 50, 90, 160, 330, 650
(a) 230
(b) 470
(c) 310
(d) 190
(e) None of these

Q44. In each of the given two series, one number is wrong. Also, some relationships are given related to right number (which will come in the place of given wrong number) in both the series.
Series I – 24, 16, 20, 34, 72, 180, 556
Series II – 13, 76, 132, 180, 223, 258, 286
(A) difference of right numbers is divisible by 3.
(B) Sum of both the right numbers is divisible by 73.
(C) Both right numbers lie between 180 and 185.
(a) Only (A) & (C) correct
(b) Only (A) & (B) correct
(c) Only (B) & (C) correct
(d) All (A), (B) & (C) correct
(e) None of these is correct

Q45. In the following wrong number series a term is wrong as per pattern followed in the series. You have to find that wrong term and term which should replace that wrong term is your answer. (You have to mark correct term as per series not the wrong term mentioned in series)
32, 48, 80, 112, 176, 208, 272
(a) 36
(b) 116
(c) 206
(d) 276
(e) Series is right no need to replace any number

Directions (46-50): Find out the approximate value which is closest to the value that should replace the question mark (?) in the following questions.

Q46. 35% 1579 + 29% of 4516 = ? × 41 + 468 + 773.98 – 199.83
(a) 26
(b) 20
(c) 49
(d) 30
(e) None of these

Q47. 49.05 × 19.95 - 24.99 × 14.12 = (36 + ?) × 9
(a) 73
(b) 81
(c) 36
(d) 42
(e) 29

Q48. $\frac{26}{5}$ of 195.05 + $6\frac{1}{4}$ of 2309.49 =? % of (4991.92) + 732.85 + 14434.86
(a) 4
(b) 9
(c) 17
(d) 27
(e) 29

Q49. 24.75% of 6781 + 55.23% of 8439 = ?
(a) 6467
(b) 6417
(c) 6307
(d) 6637
(e) 6337

Q50. 27.951% of 449.32 − 81.99% of 499.72 = ? − $\frac{12}{13}$ of 105
(a) 188
(b) - 208
(c) - 188
(d) 170
(e) – 158

Directions (51–55): Read the following information carefully and answer the questions.

x women can complete a piece of work in 2y days. 1.5x men can complete the same work in y days while 2x children can complete the same work in 3y days. 8 women, 8 children and 8 men together can complete a work in $22\frac{1}{2}$ days. 9 men can complete the same work in (y + 20) days.

Q51. What is the value of y.

(a) 14
(b) 18
(c) 20
(d) 16
(e) 24

Q52. If 36 women started the work and after 4 days 30 women are replaced by 8 men then, find the total time in which work will be completed.

(a) $20\frac{4}{25}$ days
(b) $22\frac{3}{25}$ days
(c) 12 days
(d) 12.5 days
(e) $24\frac{4}{25}$ days

Q53. Find the value of x.

(a) 12
(b) 14
(c) 10
(d) 15
(e) 11

Q54. When 8 women, 8 children and 8 men work together and completed the work than what percentage of total work is completed by children.

(a) 16%
(b) 10%
(c) 15%
(d) 8.33%
(e) 12.5%

Q55. (x – 6) women worked for (y – 6) days and (x – 6) man worked for (y – 10) days then in what time remaining work will be completed by (x – 6) children

(a) $152\frac{2}{3}$ days
(b) $148\frac{1}{3}$ days
(c) 145 days
(d) 154 days
(e) 158 days

Directions (56-60): Each of the following question is followed by two quantities i.e. Quantity I & Quantity II which you have to calculate and mark answer accordingly.

Q56. $\frac{1}{a}+\frac{1}{b}=?$

Quantity I: a & b are roots of equation $x^2 + x - 6 = 0$

Quantity II: $a^2 + b^2 = 20; ab = 8$

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

Q57. An article which costs Rs 500 was marked up by 20% above its cost price.

Quantity I: **Discount percentage offered,** when the article was sold at a price which gave a profit of Rs 50.

Quantity II: **Profit Percentage,** when two successive discounts each of 5% is offered.

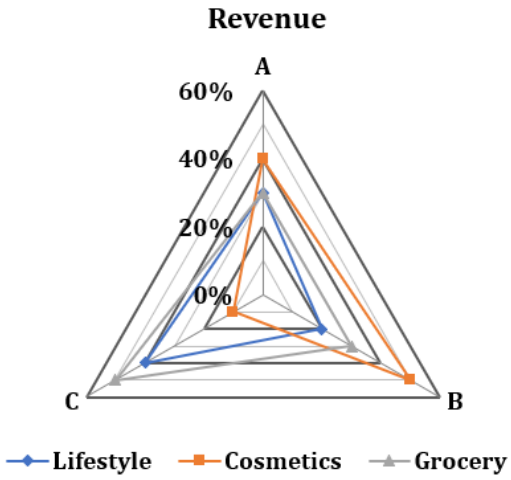
(a) Quantity I>Quantity II
(b) Quantity I≥Quantity II
(c) Quantity I<Quantity II
(d) Quantity I≤Quantity II
(e) Quantity I=Quantity II or no relation

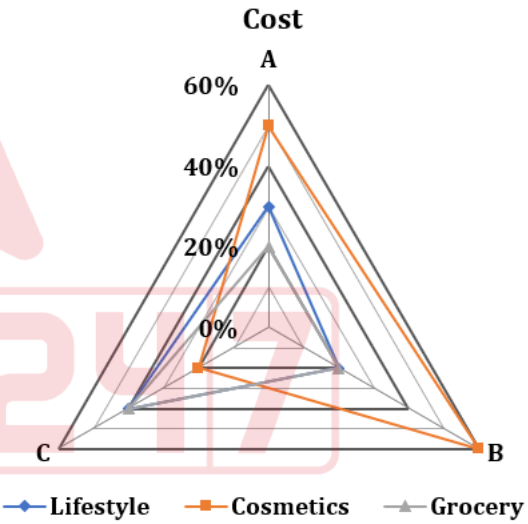
Q58. Average marks obtained by a candidate in 3 subjects (Physics, Chemistry, Maths) is 90.
Quantity I: The candidate scored 90 marks in Maths. Marks scored by him in Physics is equal to average of marks obtained by him in Maths & Chemistry, then how much marks he scored in Physics?
Quantity II: **marks scored in Chemistry,** when his marks in Physics are equal to average marks of all 3 subjects. Marks scored in Chemistry are 25% more than that of in Maths.
(a) Quantity I>Quantity II
(b) Quantity I≥Quantity II
(c) Quantity I<Quantity II
(d) Quantity I≤Quantity II
(e) Quantity I=Quantity II or no relation

Q59. A bag contains total 12 balls in which there are 5 green balls and rest are blue and red balls, if two balls taken out at random from bag probability of both being either red or blue is $\frac{1}{6}$.
Quantity I – What is difference *between blue & red balls*.
Quantity II – $y^4 = 81$, value of 'y'
(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

Q60. Side of square is 3.5 cm more than radius of circle and Radius of circle is 50% more than breadth of rectangle whose length is 15 cm. Circumference of circle is 50% more than perimeter of rectangle.
Quantity I – What will be area of square. (In sq.cm.)
Quantity II – two times of area of rectangle. (In sq.cm.)
(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

Directions (61-65): Study the radar charts carefully and answer the following questions.
There are three stores (A, B & C) which deal in 3 segments (Lifestyle, Cosmetics & Grocery) only. Radar charts shows percentage contribution of each segment in total revenue and total cost of that store. Ratio of total cost of store – A, B & C is 16 : 40 : 25 respectively.





Note – 1. Profit = Revenue – Cost
2. Profit % = $\frac{\text{Profit}}{\text{Cost}} \times 100$

Q61. Profit earned by store – B in Lifestyle is Rs.4000 more than that earned by store – A in Lifestyle and ratio of revenue of Grocery of store – A to revenue of Grocery of store – B is 2 : 5. If cost of Cosmetics of store – C is Rs.25000, then find overall profit percentage of store – A.
(a) 35%
(b) 30%
(c) 40%
(d) 25%
(e) 20%

Q62. Revenue of store – C from Grocery is Rs.95000 more than revenue of store – B from Cosmetics and revenue of store – C from Cosmetics is $9\frac{3}{8}\%$ more than revenue of store – B from Lifestyle, then find total revenue of store – B & C together.
(a) Rs.510000
(b) Rs.440000
(c) Rs.580000
(d) Rs.550000
(e) Rs.470000

Q63. Average cost of cosmetics for store – A, B & C is Rs.37000 and total revenue of store – A is Rs.40,000 less than total revenue of store – B. If profit earned by store – A in Lifestyle is Rs.9600, then find profit/loss percentage earned by store – B on Cosmetics and Grocery together.
(a) 100%
(b) 50%
(c) 70%
(d) 30%
(e) 0%

Q64. Revenue of store – A & C together from Lifestyle is Rs.70500 and overall profit percentage of store – A & store – C is $17\frac{3}{16}\%$ and 20% respectively, then find total cost of store – B & C together.
(a) Rs.180000
(b) Rs.300000
(c) Rs.260000
(d) Rs.220000
(e) Rs.200000

Q65. Revenue of store – B & C together from Lifestyle is Rs.76800 and revenue of store – B & C together from Grocery is Rs.99200. Find total revenue of store – B is how much more or less than total revenue of store – C?
(a) Rs.84000
(b) Rs.110000
(c) Rs.64000
(d) Rs.96000
(e) Rs.60000

Directions (66-70): What will come in place of (?) in the following questions.

Q66. 81, ?, 130, 147, 179, 194
(a) 108
(b) 100
(c) 115
(d) 111
(e) 104

Q67. ?, 378, 174, 438, 106, 514
(a) 154
(b) 172
(c) 128
(d) 226
(e) 202

Q68. 16, ?, 80, 172, 360, 740
(a) 48
(b) 52
(c) 36
(d) 44
(e) 40

Q69. 44, 106, 180, 262, ?, 442
(a) 474
(b) 498
(c) 466
(d) 484
(e)348

Q70. 64, 142, ?, 532, 844, 1234
(a) 312
(b) 364
(c) 488
(d) 436
(e) 298

Q71. Anurag spends 30% of his income in FD, 10% of remaining given to his mother, $11\frac{1}{9}$% of remaining spend in room rent. If Anurag divided remaining income between his son and daughter equally and difference between amount spend by Anurag in FD and amount given to his daughter is Rs. 2160, then find monthly income of Anurag (in Rs.)?
(a) 108000
(b) 105000
(c) 96000
(d) 84000
(e) 120000

Directions (72-73): Time taken by car P to cover a certain distance is 50% more than the time taken by car Q to cover the same distance. Car P and another car R starts simultaneously from a same point in same direction. After 1 hour, car Q starts in the same direction as that of car P and R. Q overtakes P in 'x' hours and R in 'x+1.5' hours.

Q72. If speed of car P is 120 km/hr, then what is the speed of car R.
(a) 120 km/hr
(b) 140 km/hr
(c) 100 km/hr
(d) 75 km/hr
(e) 80 km/hr

Q73. If car P double its speed, then speed of car P is what % of speed of car Q.
(a)$133\frac{1}{3}$%
(b) 100%
(c) 80%
(d) 60%
(e) None of these

Q74. A man invested Rs. P at the rate of 10% per annum for three years on SI and Rs. Q at the rate of 20% per annum for two years on CI. If ratio of total SI to total CI get by man is 5:11, then which possible values will come in the place of P & Q?
(A) 1200 and 1800
(B) 600 and 900
(C) 400 & 800
(D) 300 & 450
(a) Only (A) & (B)
(b) Only (A) & (D)
(c) Only (B) & (D)
(d) All, (A), (B), (C) & (D)
(e) Only (A), (B) & (D)

Q75. 'P' is a set of perfect square numbers less than 60 and 'Q' is a set of composite odd numbers less than 25. Find probability of $6^3 < (P^2 + Q) < 11^3$.
(a) $\frac{6}{7}$
(b) $\frac{3}{5}$
(c) $\frac{2}{7}$
(d) $\frac{3}{7}$
(e) None of these

Direction (76–80): Table given below shows data regarding number of people applied for loan under 'PM Mudra Yojna' from five different villages. Read the data carefully and answer the questions.

Villages	Number of people applied for loan	Percentage of people who get loan out of total number of people applied for loan	Percentage of male who get loan out of total people who get loan	Ratio of female who do not get loan to female who get loan
P	7200	$66\frac{2}{3}$%	65%	10 : 21
Q	8000	60%	75%	3 : 5
R	8800	$81\frac{9}{11}$%	82%	4 : 9
S	10000	72 %	76%	16 : 27
T	9600	68.75%	80%	8 : 11

Q76. What is the difference between number of males applied for loan from village P and village T?
(a) 2600
(b) 2200
(c) 2400
(d) 3000
(e) 2000

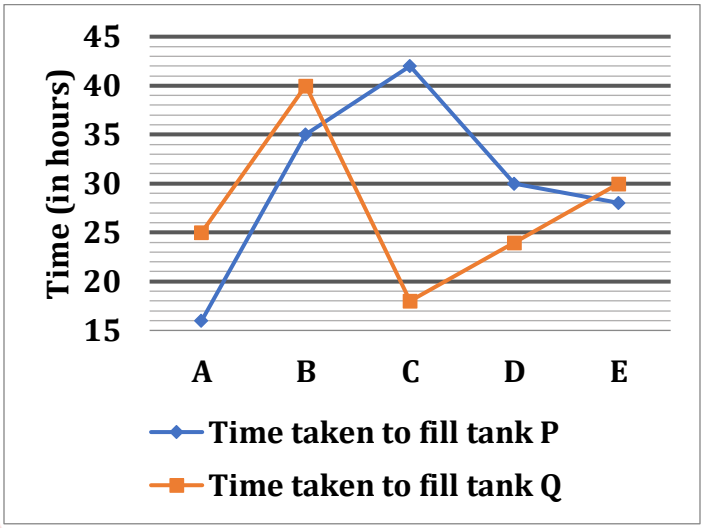
Q77. Total females who do not get loan from village S is what percent more or less than total females who do not get loan from village Q?
(a) $40\frac{2}{9}\%$
(b) $44\frac{2}{9}\%$
(c) $46\frac{2}{3}\%$
(d) $48\frac{2}{3}\%$
(e) $42\frac{2}{9}\%$

Q78. What is the ratio of total males who do not get loan from village Q to total males who do not get loan from village S?
(a) 113:111
(b) 115: 111
(c) 64: 111
(d) 155: 111
(e) 111 : 115

Q79. How many females applied for loan from the village where number of males who get loan are second highest among all villages?
(a) 2772
(b) 2726
(c) 2752
(d) 2742
(e) 2732

Q80. What is the average of number of males who do not get loan from village R and number of females who get loan from village R?
(a) 1120
(b) 1140
(c) 1260
(d) 1200
(e) 1160

Directions (81-85): Study the line chart given below and answer the following questions. The line chart shows the time taken by five pipes (A, B, C, D & E) to fill tank – P & tank – Q individually.



Q81. Total capacity of tank – P is 360 liters more than total capacity of tank – Q. Pipe – B fills tank – Q in $33\frac{1}{3}$ hours when it fills tank – Q with same efficiency with which it filled tank – P. Find total capacity of tank – P & Q together?
(a) 12840 liters
(b) 13620 liters
(c) 13180 liters
(d) 14760 liters
(e) 14340 liters

Q82. Pipe – A, C & E filled tank – Q in $29\frac{1}{3}$ hours when they opened alternatively such that pipe – A fills in 1st hour, followed by pipe – C and then followed by pipe – E and pipe – C filled tank – Q with the efficiency with which it filled tank – P, then find total capacity of tank – P is what percent of that of tank – Q?
(a) $114\frac{1}{3}\%$
(b) $121\frac{1}{3}\%$
(c) $95\frac{2}{3}\%$
(d) Cannot be determined.
(e) None of the above.

Q83. Time taken by C & E together to fill tank – P is what percent of time taken by B & D together to fill tank – Q?
(a) 128%
(b) 112%
(c) 124%
(d) 120%
(e) 116%

Q84. Total capacity of tank – P is 3000 liters more than that of tank – Q. When pipe – B & D together filled tank – Q, then water supplied by pipe – D is 3375 liters. Find quantity of water supplied by pipe – A & E together in 6 hours in tank – P.
(a) 4950 liters
(b) 5450 liters
(c) 4250 liters
(d) 5950 liters
(e) 6650 liters

Q85. Water supplied by pipe – B, C & E together in tank – P in 5 hours is $57\frac{5}{9}\%$ of total capacity of tank – Q and pipe – A can fill 5040 liters in tank – Q in 14 hours. Find in how many hours pipe – D can fill 8232 liters in tank – P?
(a) 14 hours
(b) 16 hours
(c) 23 hours
(d) 17 hours
(e) 21 hours

Directions (86-90): In each of these questions, two equations (I) and (II) are given. You have to solve both the equations and give answer
(a) if $x > y$
(b) if $x \geq y$
(c) if $x < y$
(d) if $x \leq y$
(e) if $x = y$ or no relation can be established between x and y.

Q86. (i) $3x^2 - 17x + 20 = 0$
(ii) $5y^2 - 28y + 15 = 0$

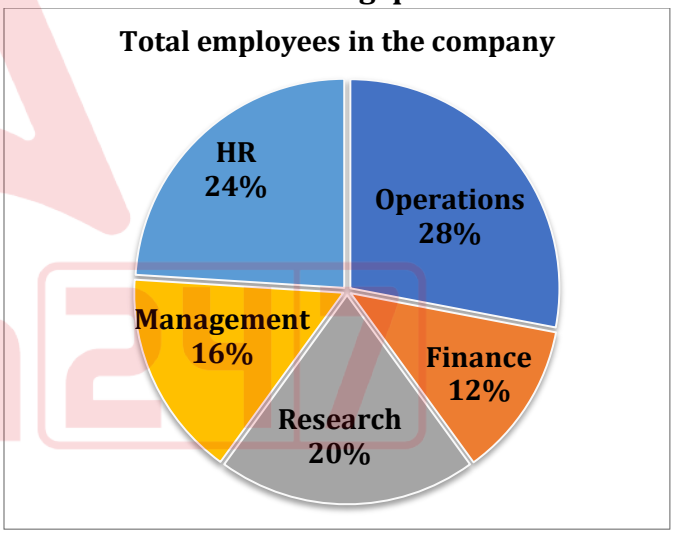
Q87. (i) $6x^2 = 11x - 4$
(ii) $2y^2 = 15y + 8$

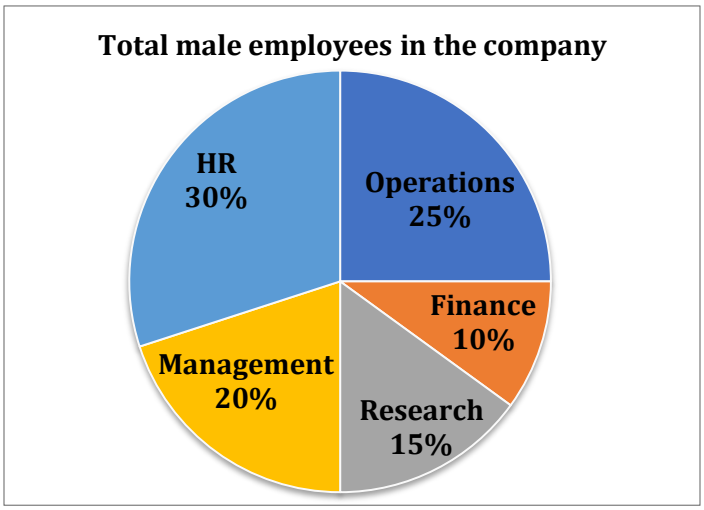
Q88. (i) $2(x - 3)^2 = (x - 3)$
(ii) $5y^2 + 6y = -1$

Q89. (i) $7x^2 + 61x + 40 = 0$
(ii) $5y^2 - 13y - 28 = 0$

Q90. (i) $x^2 - 11x + 24 = 0$
(ii) $2y^2 - 9y + 9 = 0$

Directions (91-95): Pie charts show the percentage distribution of total employees of a company in five different departments (HR, Finance, Operations, Research and Management) and percentage distribution of total male employees of the company in these departments. Study the pie charts given below and answer the following questions.





Note – Total employees in a department = Total (male + female) employees in that department.

Q91. Female in Operations department is 170 more than that of in Research department. If female in Finance & Management department together is 670, then find the number of male employees in HR department.
(a) 300
(b) 225
(c) 375
(d) 450
(e) 150

Q92. Total employees in Research and Management department together are 1200 more than total male employees in Finance and HR department together. If female employees in HR department are 30% of total employees in Research department, then find total male employees in the company.
(a) 5000
(b) 6500
(c) 5500
(d) 7000
(e) 6000

Q93. Male employees in HR department are $42\frac{6}{7}\%$ of total employees in Operations department. If difference between female employees in Finance & Operations department is 750, then find female employees in HR department.
(a) 500
(b) 900
(c) 600
(d) 1200
(e) 1000

Q94. Ratio of total male employees to total female employees in Operations and Research department together is 5 : 11. If female employees in HR department are 510, then find difference between total male employees and total female employees in the company.
(a) 1650
(b) 1300
(c) 750
(d) 1000
(e) 950

Q95. Average number of employees in Research, Management and HR is 200 more than average number of male employees in Operations, Research and Management. If female employees in Research department is 50 more than male employees in same department, then find total employees in the company.
(a) 4000
(b) 5000
(c) 4500
(d) 3500
(e) 2500

Q96. A drive out at 40 km/hr in the dessert on a road and returns over the same road at 30 km/hr and takes less than 6 hours? Then find which of the following can be the possible value (s) of distance (distance is an integral value divisible by 8)?
I. 16
II. 24
III. 40
IV. 48
V.72
(a) Only III and IV
(b) Only I, II and III
(c) Only IV and V
(d) Only II and III
(e) None of these

Q97. The ratio of quantity of milk to that of water in the mixture is 2: 5. When x lit of milk is added to the mixture, ratio of milk to water becomes 2: 3 and when 20 lit of water is further added to the mixture, ratio of milk to that of water becomes 1: 2. Find the value of x?
(a) 20 lit
(b) 16 lit
(c) 18 lit
(d) 24 lit
(e) 12 lit

Q98. Veer has two articles of the same cost price. He has sold both articles to Ayush at Rs 320 each. Ratio of profit % on first article (calculated on CP) to profit % on second article (calculated on SP) is 8: 5. Ayush sold the first article at Rs Z and earns a profit which is 20% less than profit earned by Veer on first article?
(a) Rs 408
(b) Rs 436
(c) Rs 424
(d) Rs 416
(e) Rs 420

Q99. Shivam alone can do a work in 12 days and Maanik alone can do it in 15 days. Both started the work together and after working for 4 days, Shivam left the work. After 2 more days, Veer joins Maanik and the whole work is completed in 2 days more than the time taken by Shivam and Maanik together to do that work. Find the time taken by Veer alone to do that work?
(a) 36 days
(b) 24 days
(c) 30 days
(d) 27.5 days
(e) 20 days

Q100. Amit lends Rs. 1725 at the beginning of a year at a certain rate of interest at SI. After 4 months, he lends a sum of Rs 1075 at a rate 7% more than the earlier rate of interest at SI. At the end of the year, if difference between the interest received from both the amounts is Rs 30.5 then, find the rate of interest at which second sum is invested?
(a) 12%
(b) 13.5%
(c) 22.5%
(d) 17.5%
(e) 15%

Solutions

S1. Ans.(a)
Sol. Let radius of first and second ball be 4r cm and 3r cm respectively
When we cut a spherical ball, it becomes a hemisphere
So, $4 \times \frac{22}{7} \times (4r)^2 - 3 \times \frac{22}{7} \times (3r)^2 = 1424.5$
$r^2 = 12.25$
r = 3.5 cm
Radius of bigger ball = 4 × 3.5 = 14 cm

S2. Ans.(e)
Sol. Let total capacity of tank be 120 units (LCM of 24, 15 & 20).
So, efficiency of pipe – P = $\frac{120}{24}$ = 5 units/hour
Efficiency of pipe – Q = $\frac{120}{15}$ = 8 units/hour
And, efficiency of pipe – R = $\frac{120}{20}$ = 6 units/hour
Tank filled by pipe – P, Q & R in 3 hours
= 8 – 6 + 5 = 7 units
Tank filled by pipe – P, Q & R in 48 hours
= $7 \times \frac{48}{3}$ = 112 units
Required time = $\frac{120-112}{8} + 48$ = 49 hours

S3. Ans.(c)
Sol. Ratio of Profit share of Maanik to Shivam
= $\big((20000 \times 4) + (30000 \times 8)\big) : \big((32000 \times 10) + (40000 \times 2)\big)$
= 4 : 5
Total profit = $30000 \times \frac{9}{5}$
= Rs.54000

S4. Ans.(e)
Sol. ATQ,
$P\left(1 + \frac{18}{100}\right)^2 = 83544$
P = Rs 60000
And,
$\frac{(P+X)\times 20\times 2}{100} = 30000$ ...(i)
Put value of P in (i):
$\frac{(60000+X)\times 20\times 2}{100} = 30000$
$60000 + X = 75000$
$X =$ Rs 15000

S5. Ans.(d)
Sol. Ratio of cost price of bat to that of ball
Given, 2bats = 6 balls
1 bat of 3 balls
Bat : ball = 3 : 1
Let cost price of one bat and one ball be 3a & a respectively.
So, selling price of 1 bat = $3a \times \frac{140}{100}$ = Rs 4.2a
And, selling price of 1 ball = $a \times \frac{150}{100}$ = Rs 1.5a
Now, let number of bats and balls sold by shopkeeper be 2b & 3b respectively.
Total cost price for shopkeeper
= (2b × 3a) + (3b × a) = Rs. 9ab
Total selling price for shopkeeper
= (2b × 4.2a) + (3b × 1.5a) = Rs. 12.9ab
Required % = $\frac{12.9ab-9ab}{9ab} \times 100 = 43\frac{1}{3}\%$

Solutions (6-10):
Total units of three types of waves (Radio, Alpha & Micro) received in a minute
=$3600 \times \frac{35}{100} = 1260$ units

Types of waves	Radio waves	Alpha waves	Micro waves
Units	432	288	540

Let the units of Gamma rays received and UV rays received be 2x units and 3x units respectively.
Let the units of IR rays received be 'a' unit. Then units of X rays received= '2a' units
Units of β rays received=0.5a units.
ATQ
$2x - a = 72$.....(i)
And, $5x + 3.5a = 2340$ .... (ii)
On solving (i) & (ii):
⇒x=216 units and a=360 units
5 types of rays received in a minute:
IR rays= 360 units
UV rays= 648 units
Gamma rays=432 units
X rays=720 units
β rays=180 units

S6. Ans.(c)
Sol. Total IR rays received in 1 min= 360 units
Time taken to receive 8748 units of IR
= $\frac{8748}{360} = 24.3$ min

S7. Ans.(c)
Sol. Amount of UV received in 5 mins
= $648 \times 5 = 3240$ units
Amount of IR received in 2 mins = 720 units
Amount of UV received in 5 mins = $\frac{3240}{720} = 4.5$ times of the amount of IR rays received in 2 mins.

S8. Ans.(a)
Sol. Amount of Gamma rays received in one minute when ozone reflects 55% of the sun rays= 432 units
Required amount of Gamma rays when the ozone layer disappear completely
= $432 \times \frac{100}{45} = 960$ units

S9. Ans.(e)
Sol. Amount of Micro waves received in 5 minutes= $540 \times 5 = 2700$ units
Amount of Alpha waves received in 4 minutes
= $288 \times 4 = 1152$ units
Required difference=1548 units

S10. Ans.(d)
Sol. To generate 40 units of vitamin D, requirement of β rays=$30 \times 40 = 1200$ units
Required time of exposure= $\frac{1200}{180} = 6\frac{2}{3}$ min

S11. Ans.(e)
Sol. The given pattern is
×0.5 + 0.5, ×1 + 1, ×2 + 2, ×4 + 4, ×8 + 8, ×16 + 16
So, new series will be
$9 \times 0.5 + 0.5 = 5$
$5 \times 1 + 1 = 6$
$6 \times 2 + 2 = 14$
$14 \times 4 + 4 = 60$
So, E= 60

S12. Ans.(d)

Sol. The given pattern is

$+1^3$, $+2^3$, $+3^3$, $+4^3$, $+5^3$, $+6^3$

New series will be

12+1=13

13+8=21

21+27=48

48+64=112

So, E = 112

S13. Ans.(e)

Sol. The given pattern is –

1240 , 1492 , 1756 , 2032 , 2320 , 2620

+252 +264 +276 +288 +300

So, (E) = 2328 + 252 + 264 + 276 + 288 = 3408.

S14. Ans.(a)

Sol. The given pattern is –

3756 3763 3749 3777 3721 , 3833

+7 −14 +28 −56 +112

So, (E) = 3760 + 7 – 14 + 28 – 56 = 3725

S15. Ans.(c)

Sol. The given pattern is –

1256 , 1256 , 1260 , 1278 , 1326 , 1426

1^3-1^2 2^3-2^2 3^3-3^2 4^3-4^2 5^3-5^2

So, (E) = 1258 + 0 + 4 + 18 + 48 = 1328

S16. Ans.(d)

Sol. Let number of girls in Mech. be = 100x

⇒ number of boys in Mech. = 130x

ATQ,

100x + 130x = 805

⇒ 230x = 805

⇒ $x = \frac{805}{230} = 3.5$

Number of boys in Mech. = 3.5 × 130 = 455

Let number of girls in IT be = 100y

⇒ number of boys in IT = 120y

ATQ,

100y + 120y = 990

⇒ 220y = 990

⇒ y = 4.5

number of girls in IT= 4.5 × 100 = 450

Required difference= 455-450=5

S17. Ans.(a)

Sol. Let number of girls in Civil = 100x

⇒ Number of boys in Civil = 140x

ATQ,

100x + 140x = 672

⇒ 240x = 672

⇒ x = 2.8

Total number of girls in Civil = 280

Let number of girls in CSE = 100y

⇒ number of boys in CSE= 125y

ATQ,

100y + 125y = 900

⇒ 225y = 900

⇒ y = 4

Total number of girls in CSE = 4× 100 = 400

Let number of girls in ECE be 100z

⇒ Number of boys in ECE= 145z

ATQ,

100z + 145z = 784

⇒ z = 3.2

Total number of girls in ECE = 320

Required average = $\frac{280+400+320}{3} = \frac{1000}{3}$

S18. Ans.(d)

Sol. Let number of girls in Biotech be = 100x

⇒number of boys in Biotech = 135x

ATQ,

100x + 135x = 705

⇒ 235x = 705

⇒ x = 3

Total number of boys in Biotech = 405

Number of girls in Biotech= 300

Required % = $\frac{300 \times \frac{40}{100}}{405 \times \frac{40}{100}} \times 100 = 74\frac{2}{27}\%$

S19. Ans.(b)

Sol. Number of students from CSE who got placed in TCS = $75 \times \frac{900}{100} = 675$

Number of students from IT who got placed in TCS = $60 \times \frac{990}{100} = 594$

Total number of CSE & IT students placed in TCS=1269

Total number of students placed in TCS from that college = $1269 \times \frac{4}{3} = 1692$

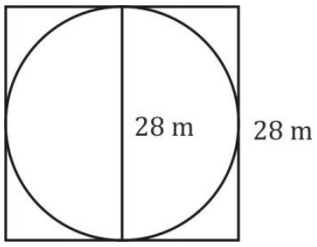
Total number of boys from CSE and IT placed in TCS=$(675-350)+(594-990\times0.3)$
$=622$
Required part=$\frac{622}{1692}=\frac{311}{846}$

S20. Ans.(b)
Sol. Let number of girls in Mech. = 100x
⇒ Total number of boys in Mech. = 130x
ATQ,
100x + 130x = 805
⇒ 230x = 805
⇒ x = 3.5
Total number of girls in Mech. = 350
Let number of girls in Civil = 100y
⇒ Number of boys in Civil = 140y
ATQ,
100y + 140y = 672
⇒ 240y = 672
⇒ y = 2.8
Total number of girls in Civil = 280
Required % = $\frac{350-280}{280}\times100=25\%$

S21. Ans.(b)
Sol. Profit ratio of Amar, Akbar & Anthony
= $(2000\times8)+(1000\times4):(X\times12):(2X\times4)+(3X+1000)\times4$
= 20000: 12X : 20X + 4000
ATQ, $\frac{12X}{32X+24000}\times60000=18000$
On solving, X = Rs 3000
Required profit ratio
Amar : Akbar = $(X+2000)\times12:(X-1000)\times12$
= 5000 : 2000
= 5 : 2

S22. Ans.(e)
Sol. 1 hour work of A & B when both act as outlet
$\frac{60}{72}=\frac{1}{2}+\frac{1}{x}$
x = 3 hours
1 hour work of A(inlet) & C as outlet
$=\frac{1}{2}-\frac{1}{y}=\frac{y-2}{2y}$ units
Time taken by A & C to fill the tank = $\frac{2y}{y-2}$ hours
1 hour work of B (inlet) & C as outlet
$=\frac{1}{3}-\frac{1}{y}=\frac{y-3}{3y}$ units
Time taken by B & C to fill the tank = $\frac{3y}{y-3}$ hours
ATQ, $\frac{2y}{y-2}=\frac{1}{3}\times\frac{3y}{y-3}$
y = 4 hours
1 hour work of B & C as inlets = $\frac{1}{3}+\frac{1}{4}=\frac{7}{12}$ units
Required time = $\frac{1}{\frac{7}{12}}=\frac{12}{7}=1\frac{5}{7}$ hours

S23. Ans.(d)
Sol. Area of the space left out = Area of square – Area of circle



$=(28)^2-\frac{22}{7}\times14\times14$
$=28\left(28-\frac{11\times14}{7}\right)$
$=28(28-22)$
$=28\times6$
$=168\ m^2$

S24. Ans.(b)
Sol. Let speed of boat in still water & speed of stream be 'u' & 'v' kmph respectively
$u-v=\frac{D}{5}$ ……(i)
$u+v=\frac{D+5}{3}$ …… (ii)
$\frac{D+10}{u+v}+\frac{2D-4}{u-v}=12$ ……(iii)
Using (i) & (ii) in (iii)
$\frac{D+10}{D+5}\times3+\frac{2D-4}{D}\times5=12$
$D^2=100$
D = 10 km (neglecting negative value)
u – v = 2
u + v = 5
u = 3.5 kmph

S25. Ans.(a)
Sol. ATQ, $P\left(1+\frac{10}{100}\right)^3-P=\frac{2\times P\times20\times2T}{100}$
$T=\frac{331}{1000}\times\frac{100}{80}=0.41375$ years
So, 0.367 < T < 0.44

S26. Ans.(c)

Sol. From I: Let marked price of B & C be Rs.100x each.

Selling price of C = $100x \times \frac{90}{100}$ = Rs.90x

And, cost price of C = $\left(90x - (100x - 90x) \times \frac{2}{3}\right)$

$250 = 90x - \frac{20x}{3}$

$250 = \text{Rs.}\frac{250x}{3}$

$x = 3$

Let profit earned and discount allowed on B be 3a & 5a respectively.

Now, marked price of B = 100x = Rs.300

Selling price of B = Rs. $(300 - 5a)$

And, cost price of B = Rs. $(300 - 5a - 3a)$

= Rs. $(300 - 8a)$

From II: Let selling price of B be Rs.100y

So, selling price of A = Rs. $(100y + 195)$

Now, cost price of A = Rs. $(100y + 195) \times \frac{100}{87.5}$

Hence, cost price of B = Rs. $(100y + 195) \times \frac{100}{87.5} \times \frac{3}{8}$

From I & II: $(300 - 5a) = 100y$

$\Rightarrow 20y + a = 60$ ....(i)

Now,

$(100y + 195) \times \frac{100}{87.5} \times \frac{3}{8} = (300 - 8a)$

$\Rightarrow 300y + 56a = 1515$ ...(ii)

On solving (i) & (ii), we get:

$a = 15,\ y = 2.25$

So, cost price of article – B = Rs.180

Hence, both statements together are sufficient to answer the question.

S27. Ans.(e)

Sol. From I & II: Let period of investment in scheme – A and B be 2a years & 3a years respectively and let rate of interest offered by scheme – B be R% p.a.

So, rate of interest offered by scheme – A = (R + 2) %

ATQ, $\left(5P\left(1 + \frac{R+2}{100}\right)^{2a} - 5P\right) + \left(\frac{7P \times R \times 3a}{100}\right)$

$= 232704$ ....(i)

Now, period of investment in scheme – C = a years

Now, $\left(\left(\frac{7P \times R \times 3a}{100}\right) + 7P\right) + \left(4P\left(1 + \frac{15}{100}\right)^{a}\right)$

$= 166860$ ...(ii)

Hence, both statements together are not sufficient to answer the question.

S28. Ans.(c)

Sol. Given let given number of white balls = a

From I: let probability = $\frac{x}{y}$

Let number of red balls → px, total balls → py

From II: Let probability = $\frac{s}{t}$

Let no. of black ball = qs, total balls = qt

From I & II: px + a + qs = qt = py

we know the values of x, y, s, t and a so we can find the value of p and q

So, probability of white ball found = $\frac{a}{qt}$ or $\frac{a}{py}$

∴ Both statements together are sufficient to answer the question.

S29. Ans.(c)

Sol. Quantity I: Prabhas travels a distance of 100 km in 1 hour when he stops for 10 min.

Actual travel time = 60 – 10 = 50 min

Speed of car = $\frac{100}{50} \times 60 = 120$ kmph

Required time = $\frac{200}{120} \times 60 = 100$ min

Quantity II: Required time = $\frac{20}{7+3} = 2$ hour

$= 120$ minutes

Quantity I<Quantity II

S30. Ans.(e)

Sol. Quantity I: Given a &b are roots of $x^2 + x - 6 = 0$

Sum of roots, $a + b = -1$

Product of roots, $ab = -6$

Required value = $\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{-1}{-6} = \frac{1}{6}$

Quantity II: we know, $(a + b)^2 = a^2 + b^2 + 2ab$

$= 20 + 2(8) = 36$

$a + b = \pm 6$

Required value = $\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{6}{8}$

$= \frac{3}{4}$ (when $a + b = +6$)

Required value = $\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{-6}{8}$

$= \frac{-3}{4}$ (when $a + b = -6$)

No relation between quantity I & II.

Solutions (31–35): Let fees for Graduation, PG, Diploma, Certificate courses in 2016 by 100a, 100b, 100c, 100d respectively

	2016	2017	2018
Graduation	100a	120a	138a
PG	100b	110b	132b
Diploma	100c	130c	143c
Certificate	100d	125d	150d

S31. Ans.(e)
Sol. ATQ, $\frac{120a}{150d} = \frac{4}{1}$
a : d = 5 : 1
let a = 5k, d = k
required % = $\frac{500k-375k}{375k} \times 100 = 33\frac{1}{3}\%$

S32. Ans.(b)
Sol. ATQ, (110b + 132b) – (130c + 143c)
= 100b + 100c
242b – 273c = 100b + 100c
b : c = 373 : 142
required ratio = $\frac{(100b+110b+132b)}{3} : \frac{100c+130c+143c}{3}$
= 171 : 71

S33. Ans.(d)
Sol. ATQ, 138a = 276000
a = 2000
fees in 2016 = Rs 200000
total fees paid = $200000 + 200000 \times \frac{110}{100} + 200000 \times \frac{110}{100} \times \frac{110}{100} + 200000 \times \frac{110}{100} \times \frac{110}{100} \times \frac{110}{100}$
= 200000 + 220000 + 242000 + 266200
= Rs 928200

S34. Ans.(a)
Sol. Fees of diploma course per student in 2018
= $\frac{57200000}{200}$ = Rs 286000
ATQ, 143c = 286000 ⇒ c = 2000
required difference = 30c = Rs 60000

S35. Ans.(c)
Sol. ATQ, $\frac{110b+132b}{2} = \frac{100d+125d+150d}{3}$
121b = 125d
b : d = 125 : 121 or 125k : 121k
fees of PG in 2016 = 12500k
fees of certificate course in 2016 = 12100k
required % = $\frac{12500k-12100k}{12500k} \times 100 = 3.2\%$

S36. Ans.(e)
Sol. Total marks obtained = 70 × 5 = 350%
Let maximum marks in each subject be 100x
Total maximum marks = 500x
Total marks obtained = $\frac{350}{100} \times 100x = 350x$
Marks obtained in each subject
= $\frac{9}{35} \times 350x = 90x$
= $\frac{8}{35} \times 350x = 80x$
= $\frac{7}{35} \times 350x = 70x$
= $\frac{6}{35} \times 350x = 60x$
= $\frac{5}{35} \times 350x = 50x$
Passing marks in each subject = $\frac{55}{100} \times 100x = 55x$
Prem passed in 4 subjects as in one subject, he gets 50x marks while passing marks were 55x

S37. Ans.(a)
Sol. Let price of washing machine is Rs x
Let Amount by which price of TV is more than that of washing machine be Rs k
Price of TV = Rs (x + k)
Price of refrigerator = Rs (x – k)
ATQ, $\frac{x+k+x+x-k}{3} = \frac{x+k+x}{2} - 5000$
$x = x + \frac{k}{2} - 5000$
k = Rs 10000
required difference = $\frac{x+k+x}{2} - \frac{x+x-k}{2} = x + \frac{k}{2} - x + \frac{k}{2}$
= k = Rs 10000

S38. Ans.(d)
Sol. Possible cases
(I) 5 red, 3 pink, 2 green
Probability = $\frac{{}^8C_5 \times {}^5C_3 \times {}^4C_2}{{}^{17}C_{10}} = \frac{3360}{{}^{17}C_{10}}$
(II) 6 red, 3 pink, 1 green
Probability = $\frac{{}^8C_6 \times {}^5C_3 \times {}^4C_1}{{}^{17}C_{10}} = \frac{1120}{{}^{17}C_{10}}$
(III) 5 red, 4 pink, 1 green
Probability = $\frac{{}^8C_5 \times {}^5C_4 \times {}^4C_1}{{}^{17}C_{10}} = \frac{1120}{{}^{17}C_{10}}$
Required probability = Case (I) + (II) + (III)
= $\frac{5600}{17 \times 8 \times 13 \times 11} = \frac{700}{2431}$

S39. Ans.(b)

Sol. Let speed of man be 's' kmph & he increase his speed by 'x' kmph

$s = \frac{20}{t}$ .....(i)

actual time to be adjusted = 10 + 20 = 30 min

ATQ, $\frac{10}{s} + \frac{10}{s+x} = t - \frac{1}{2}$

Using (i), $s^2 + sx - 20x = 0$

On solving, s = - 5x, 4x

(since speed cannot be negative & it's mentioned speed is increased not decreased)

s : x = 4 : 1

Required % = $\frac{x}{s} \times 100 = 25\%$

S40. Ans.(c)

Sol. Total number of votes polled = $\frac{X}{40} \times 100 = \frac{5X}{2}$

Remaining votes = $\frac{5X}{2} - X = \frac{3X}{2}$

50% of total votes casted = $\frac{5X}{2} \times \frac{1}{2} = \frac{5X}{4}$

Number of votes he must have in order to get at least 50% of total casted votes

$= \frac{5X}{4} - X = \frac{X}{4}$

So, required % = $\frac{X \times 2}{4 \times 3X} \times 100 = 16\frac{2}{3}\%$

$16\frac{2}{3}\%$ is the minimum percentage of remaining votes Ayush need to have in order to get at least 50% of total votes.

(i) & (iii) are suitable options

S41. Ans.(e)

Sol. Patter of series –

$3 \times 1 - 1 = 2$

$2 \times 2 + 2 = 6$

$6 \times 3 - 3 = 15$

$15 \times 4 + 4 = 64$

$64 \times 5 - 5 = 315$

$315 \times 6 + 6 = 1896$

So, wrong number = 60

Now new series start with wrong number, which is 60

So, new series –

$60 \times 1 - 1 = 59$

$59 \times 2 + 2 = 120$

$120 \times 3 - 3 = 357$

$357 \times 4 + 4 = 1432$

$1432 \times 5 - 5 = 7155$

$7155 \times 6 + 6 = 42936$

So, 5th term of new series =1432

S42. Ans.(a)

Sol. Pattern of series –

$993 - (12^2 - 1) = 850$

$850 - (10^2 - 1) = 751$

$751 - (8^2 - 1) = 688$

$688 - (6^2 - 1) = 653$

$653 - (4^2 - 1) = 638$

$638 - (2^2 - 1) = 635$

So, wrong number = 750

Now new series start with wrong number, which is 750

So, new series –

$750 - (12^2 - 1) = 607$

$607 - (10^2 - 1) = 508$

$508 - (8^2 - 1) = 445$

$445 - (6^2 - 1) = 410$

$410 - (4^2 - 1) = 395$

$395 - (2^2 - 1) = 392$

So, 5th term of new series = 410

S43. Ans.(c)

Sol. Patter of series –

20 + 10 = 30

30 + 20 = 50

50 + 40 = 90

90 + 80 = 170

170 + 160 = 330

330 + 320 = 650

So, wrong number = 160

Now new series start with wrong number, which is 160

So, new series –

160 + 10 = 170

170 + 20 = 190

190 + 40 = 230

230 + 80 = 310

310 + 160 = 470

470 + 320 = 790

So, 5th term of new series = 310

S44. Ans.(d)
Sol. Series I – Wrong number = 180
Pattern of series –
$24 \times 0.5 + 4 = 16$
$16 \times 1 + 4 = 20$
$20 \times 1.5 + 4 = 34$
$34 \times 2 + 4 = 72$
$72 \times 2.5 + 4 = 184$
$184 \times 3 + 4 = 556$
So, 184 should come in place of 180.
Series II – Wrong number = 180
Pattern of series –
$13 + (7 \times 9) = 76$
$76 + (7 \times 8) = 132$
$132 + (7 \times 7) = 181$
$181 + (7 \times 6) = 223$
$223 + (7 \times 5) = 258$
$258 + (7 \times 4) = 286$
So, 181 should come in place of 180.
(A) Difference between right numbers is divisible by 3.
$(184 - 181) \div 3 = 1$
So, (A) is right
(B) $(184 + 181) \div 73 = 5$
So, (B) is right
(C) Both right numbers are 184 & 181 and both lies between 180 and 185
So, (C) is right.

S45. Ans.(e)
Sol. Pattern – 16 multiplied by consecutive prime numbers
$16 \times 2 = 32$
$16 \times 3 = 48$
$16 \times 5 = 80$
$16 \times 7 = 112$
$16 \times 11 = 176$
$16 \times 13 = 208$
$16 \times 17 = 272$
So, series is right no need to replace any number

S46. Ans.(b)
Sol. 35% of 1579 + 29% of 4516 =? × 41 + 468 + 773.98 – 199.53
or, $? \times 40 + 470 + 770 - 200$
$\approx \frac{35 \times 1600}{100} + \frac{30 \times 4500}{100}$
or, $? \times 40 + 1240 - 200$
$\approx 560 + 1350 = 1910$
or $? \times 40 + 1040 \approx 1910$
or, $? \times 40 \approx 1910 - 1040 = 870$
$\therefore ? \approx \frac{870}{40} = 21.75 \approx 20$

S47. Ans.(c)
Sol. $(36 + ?) \times 9 = 49.05 \times 19.95 - 24.99 \times 14.12$
or, $324 + 9 \times ? \approx 50 \times 20 - 25 \times 14$
or, $9 \times ? \approx 1000 - 350 - 324 = 326$
$\therefore ? \approx \frac{326}{9} \approx 36$

S48. Ans.(a)
Sol. ?% of (4991.92) +732.85+ 14434.86= $5\frac{1}{5}$ of 195.75 + $6\frac{3}{8}$ of 2309.49
or, $\frac{?\times(5000)}{100} \approx \frac{26}{5} \times 195 + \frac{50}{8} \times 2300 - 730 - 14430$
or, $? \times 50 \approx 1014 + 14375 - 730 - 14430$
$= 15389 - 15160 = 229$
$\therefore ? \approx \frac{229}{50} \approx 4$

S49. Ans.(e)
Sol. $? \approx \frac{25}{100} \times 6780 + \frac{55}{100} \times 8440$
$\approx 1695 + 4642$
≈ 6337

S50. Ans.(c)
Sol. $? \approx \frac{28\times450}{100} - \frac{82\times500}{100} + \frac{12\times104}{13}$
$? \approx 126 - 410 + 96$
$? \approx -188$

Solutions (51–55): Let one woman, one man and one child can complete w, m and c units of work in one day
From question
xw × 2y = 1.5mx × y = 2xc × 3y
2w = 1.5m = 6c
So, or
2w = 1.5m = 6c = k
So,
w : m : c = 3 : 4 : 1
Total work = $\frac{45}{2} \times 8(1w + 1m + 1c)$
$= \frac{45}{2} \times 8 \times 8 = 1440$ units
According to question
9m × (y + 20) = 1440
9 × 4 (y + 20) = 1440
y = 20
So, x × w × 2y = 1440
x × 3 × 2 × 20 = 1440
x = 12

S51. Ans.(c)
Sol. y = 20

S52. Ans.(e)
Sol. work completed by 36 women in 4 days
= 36 × 3 × 4
= 432 units
After 4 days
Remaining unit = 1008
Now in one day units completed by 6 women and 8 men = 32 + 18 = 50 units
Required time = $\left(\frac{1008}{50} + 4\right)$ days
$= 24\frac{4}{25}$ days

S53. Ans.(a)
Sol. Value of x = 12

S54. Ans.(e)
Sol. Required percentage = $\frac{1}{8} \times 100 = 12.5\%$

S55. Ans.(e)
Sol. Total work completed = 6 × 3 × 14 + 6 × 4 × 10
= 252 + 240 = 492 units
Remaining work = 1440 units – 492 units
= 948 units
Required time = $\frac{948}{6}$ days ⇒ 158 days

S56. Ans.(e)
Sol. Quantity I: Given a & b are roots of $x^2 + x - 6 = 0$
Sum of roots, $a + b = -1$
Product of roots, $ab = -6$
Required value = $\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{-1}{-6} = \frac{1}{6}$
Quantity II: we know, $(a + b)^2 = a^2 + b^2 + 2ab = 20 + 2(8) = 36$
$a + b = \pm 6$
Required value = $\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{6}{8} = \frac{3}{4}$ $(when\ a + b = +6)$
Required value = $\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{-6}{8} = \frac{-3}{4}$ $(when\ a + b = -6)$
No relation between Quantity I & II.

S57. Ans.(a)
Sol. Marked price = Rs 600
Quantity I: SP = RS 550
Discount % = $\frac{600-550}{600} \times 100 = 8\frac{1}{3}\%$
Quantity II: SP = $\frac{95}{100} \times \frac{95}{100} \times 600 = Rs\ 541.5$
Profit % = $\frac{541.5-500}{500} \times 100 = 8\frac{3}{10}\%$
Clearly, **Quantity I > Quantity II**

S58. Ans.(c)
Sol. Total marks in 3 subjects = 270
Quantity I: let marks scored in Physics & Chemistry be x & y respectively
x = $\frac{y+90}{2}$
y = 2x – 90 ……(i)
also, y = 270 – (90 + x) = 180 – x ……(ii)
equating (i) & (ii)
x = 90
Quantity II: marks in Physics = 90
Let marks in Chemistry & Maths be 5x & 4x respectively
5x + 4x + 90 = 270
x = 20
marks in Chemistry = 5x = 100
clearly, **Quantity I < Quantity II**

S59. Ans.(a)

Sol. Given, number of green balls = 5

So, let total number of blue balls = x

So, number of red balls = (7 – x)

$\frac{x\,(x-1)}{12\times11}+\frac{(7-x)(6-x)}{12\times11}=\frac{1}{6}$

$2x^2-14x+42=22$

$2x^2-14x+20=0$

$2x^2-10x-4x+20=0$

$2x(x-5)-4\,(x-5)=0$

x = 2, 5

Quantity I – Required difference = 5 – 2 = 3

Quantity II – $y^4=(\pm3)^4$

$y=\pm3$

So, **Quantity I ≥ Quantity II**

S60. Ans.(e)

Sol. Let radius of circle = r cm

So, side of square = r + 3.5 cm

Let breadth of rectangle = 2x

So, radius of circle will be = 3x

ATQ –

$\frac{2\times\frac{22}{7}\times3x}{2(2x+15)}=\frac{3}{2}$

x = 3.5 cm

Radius of circle = 10.5 cm

Breadth of rectangle = $10.5\times\frac{100}{150}=7\ cm$

Side of square = 10.5 + 3.5 = 14 cm

Quantity I – Area of square = 196 cm^2

Quantity II – two times of area of rectangle

$=2(15\times7)=210\ cm^2$

So, **Quantity I < Quantity II**

Solutions (61-65):

Let total cost of store – A, B & C be Rs.1600x, Rs.4000x & Rs.2500x respectively.

Stores	Lifestyle	Cosmetics	Grocery
A	480x	800x	320x
B	800x	2400x	800x
C	1000x	500x	1000x

Let total revenue of store – A, B & C be 100a, 100b & 100c respectively.

Stores	Lifestyle	Cosmetics	Grocery
A	30a	40a	30a
B	20b	50b	30b
C	40c	10c	50c

S61. Ans.(d)

Sol. ATQ, $500x=25000$

$\Rightarrow x=50$

Now, $\frac{30a}{30b}=\frac{2}{5}$

$\Rightarrow a:b=2:5$

$\Rightarrow b=2.5a$

Now, $(20b-800x)-(30a-480x)=4000$

$\Rightarrow 2b-3a-32x=400$ ...(ii)

Put value of x in (ii):

$2b-3a-1600=400$

$\Rightarrow 2b-3a=2000$ ....(iii)

Put value of b in (iii):

$5a-3a=2000$

$\Rightarrow a=1000$

So, b = 2500

Now, total cost of store – A = $1600x$ = Rs.80000

And, total revenue of store – A = $100a$ = Rs.100000

Required profit % = $\frac{100000-80000}{80000}\times100=25\%$

S62. Ans.(a)

Sol. ATQ, $\frac{10c-20b}{20b}=\frac{75}{800}$

$\Rightarrow\frac{2c-4b}{b}=\frac{3}{8}$

$\Rightarrow c=\frac{35b}{16}$ ...(i)

Now, $50c-50b=95000$

$\Rightarrow (c-b)=1900$ ...(ii)

On solving (i) & (ii), we get:

$b=1600,\ c=3500$

Required revenue = $100b+100c$ = Rs.510000

S63. Ans.(e)

Sol. ATQ, $\frac{800x+2400x+500x}{3}=37000$

$\Rightarrow x=30$

Now, $30a-480x=9600$ ...(i)

Put value of x in (i):

$a=800$

And, $100b-100a=40000$

$b-a=400$ ....(ii)

Put value of a in (ii):

$b=1200$

Revenue of store – B on Cosmetics and Grocery together = $50b+30b$ = 80b = Rs.96000

Cost of store – B on Cosmetics and Grocery together = $2400x+800x$ = 3200x = Rs.96000

Required profit % = $\frac{96000-96000}{96000}\times100=0\%$

S64. Ans.(c)

Sol. ATQ, $\frac{100a-1600x}{1600x} = \frac{275}{1600}$

$\Rightarrow 100a = 1875x$

$\Rightarrow a = 18.75x$

And, $\frac{100c-2500x}{2500x} = \frac{20}{100}$

$\Rightarrow c = 30x$

Now, $30a + 40c = 70500$

$3a + 4c = 7050$ ...(i)

Put value of a & c in (i):

$56.25x + 120x = 7050$

$\Rightarrow x = 40$

Required cost = $4000x + 2500x$ = 6500x

= Rs.260000

S65. Ans.(d)

Sol. ATQ, $20b + 40c = 76800$

$\Rightarrow b + 2c = 3840$ ...(i)

Now, $30b + 50c = 99200$

$\Rightarrow 3b + 5c = 9920$ ...(ii)

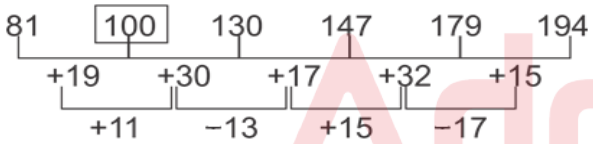
On solving (i) & (ii), we get:

$c = 1600,\ b = 640$

Required difference = $100c - 100b$ = Rs.96000

S66. Ans.(b)

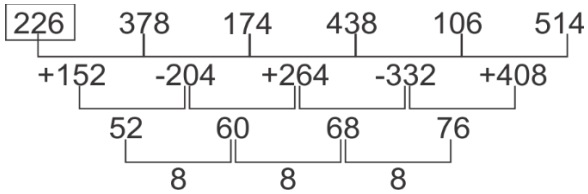
Sol. Pattern of series →



So, missing number is 100.

S67. Ans.(d)

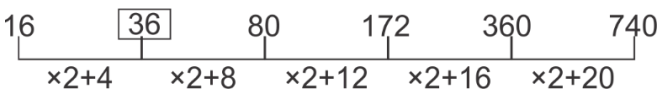
Sol. Pattern of series →



So, missing number is 226

S68. Ans.(c)

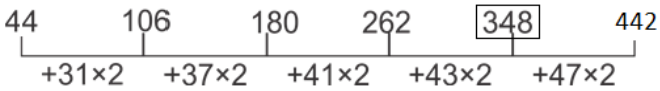
Sol. Pattern of series→



So, missing number is 36.

S69. Ans.(e)

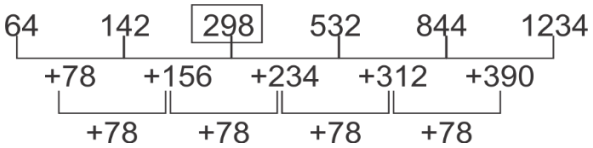
Sol. Pattern of series→



So, missing number 348.

S70. Ans.(e)

Sol. Pattern of series –



So, missing number is 298.

S71. Ans.(a)

Sol. Let monthly income of Anurag = 100x

Amount spend by Anurag in FD = 100x × $\frac{30}{100} = 30x$

Amount given by Anurag to his mother

= (100x – 30x) × $\frac{10}{100} = 7x$

Amount spend by Anurag in room rent

= (100x – 30x – 7x) × $\frac{1}{9} = 7x$

Amount given by his daughter and son

= $\frac{(100x-30x-7x-7x)}{2}$ = 28x

Given, 30x – 28x = 2160

2x = 2160

x = 1080

So, monthly income of Anurag = 108000 Rs.

Solutions (72-73):

Let Speed of car R be y kmph

Ratio of time taken by car P and Q = 1.5 : 1

So, ratio of speed of car P & Q = 1 : 1.5 or 2 : 3

Let speed of car P = 2s km/hr

Speed of car Q = 3s km/hr

Distance covered by car P in 1 hour=2s×1=2s

Distance covered by car R in 1 hour=y×1=y

According to question

$\frac{y}{3s-y} - \frac{2s}{3s-2s} = 1.5$.....(i)

S72. Ans.(b)

Sol. ratio of speed of car P & Q = 1 : 1.5 or 2 : 3

Speed of P=120 kmph

Speed of Q=180kmph

By Equation (i)

$$\frac{y}{180-y}-\frac{120}{180-120}=1.5$$

$$\frac{y}{180-y}=1.5+2$$

y=140kmph.

S73. Ans.(a)

Sol. new speed of car P =2×2s=4s

According to question=

$$\frac{4s}{3s}\times 100$$

$$=133\frac{1}{3}\%$$

S74. Ans.(e)

Sol. Cumulative interest rate for SI = $10 \times 3 = 30\%$

Cumulative interest rate for CI = $20 + 20 + \frac{20\times20}{100} = 44\%$

ATQ, $\frac{P\times30}{Q\times44}=\frac{5}{11}$

6P = 4Q ---------- (i)

Only (A), (B) & (D) satisfied the equation (i)

S75. Ans.(d)

Sol. Given 'P' is a set of perfect square numbers less than 60

So, P = {1, 4, 9, 16, 25, 36, 49}

Again 'Q' is a set of odd composite number less than 25.

So, Q = {9, 15, 21}

Total outcome = $7 \times 3 = 21$

Following the condition $6^3 < (P^2 + Q) < 11^3$, this can be only satisfied when P = (16, 25 & 36) and Q = (9, 15 & 21)

Three cases when P = 16

Also, three cases each, when P = 25 & 36

So, favorable cases = $3 \times 3 = 9$

Required probability = $\frac{9}{21}=\frac{3}{7}$

S76. Ans.(a)

Sol. Total number of males get loan from village P = $7200 \times \frac{2}{3} \times \frac{65}{100} = 3120$

Total females do not get loan from village P = $7200 \times \frac{2}{3} \times \frac{35}{100} \times \frac{10}{21} = 800$

Total males do not get loan from village P

$= 7200 \times \frac{1}{3} - 800 = 1600$

Total males applied for loan from village P

= 3120 + 1600 = 4720

Total number of males get loan from village T

$= 9600 \times \frac{68.75}{100} \times \frac{80}{100} = 5280$

Total females do not get loan from village T

$= 9600 \times \frac{68.75}{100} \times \frac{20}{100} \times \frac{8}{11} = 960$

Total males do not get loan from village T

$= 9600 \times \frac{31.25}{100} - 960 = 2040$

Total males applied for loan from village T

= 5280 + 2040 = 7320

Required difference = 7320 – 4720 = 2600

S77. Ans.(e)

Sol. Total females do not get loan from S

$= 10000 \times \frac{72}{100} \times \frac{24}{100} \times \frac{16}{27} = 1024$

Total females do not get loan from Q

$= 8000 \times \frac{60}{100} \times \frac{25}{100} \times \frac{3}{5} = 720$

Required percentage = $\frac{1024-720}{720} \times 100$

$= \frac{304}{720} \times 100 = 42\frac{2}{9}\%$

S78. Ans.(d)

Sol. Total females do not get loan from Q

$= 8000 \times \frac{3}{5} \times \frac{25}{100} \times \frac{3}{5} = 720$

Total males do not get loan from Q

$= 8000 \times \frac{40}{100} - 720 = 2480$

Total females do not get loan from S

$= 10000 \times \frac{72}{100} \times \frac{24}{100} \times \frac{16}{27} = 1024$

Total males do not get loan from S

$= 10000 \times \frac{28}{100} - 1024 = 1776$

Required ratio = $\frac{2480}{1776} = 155 : 111$

S79. Ans.(c)

Sol. Total number of males who get loan from P

$= 7200 \times \frac{2}{3} \times \frac{65}{100} = 3120$

Total number of males who get loan from Q

$= 8000 \times \frac{60}{100} \times \frac{3}{4} = 3600$

Total number of males who get loan from R
$= 8800 \times \frac{9}{11} \times \frac{82}{100} = 5904$
Total number of males who get loan from S
$= 10000 \times \frac{72}{100} \times \frac{76}{100} = 5472$
Total number of males who get loan from T
$= 9600 \times \frac{68.75}{100} \times \frac{80}{100} = 5280$
Number of males (second highest) who get loan are from village S.
Total females applied for loan from village S
$= 10000 \times \frac{72}{100} \times \frac{24}{100} \times \frac{43}{27} = 2752$

S80. Ans.(e)
Sol. Total females who get loan from village R
$= 8800 \times \frac{9}{11} \times \frac{18}{100} = 1296$
Total females who do not get loan from village R
$= = 1296 \times \frac{4}{9} = 576$
Total males who do not get loan from village R
$= 8800 \times \frac{2}{11} - 576 = 1024$
Required average $= \frac{1024+1296}{2} = 1160$

Solutions (81-85):
Let total capacity of tank – P be 1680x liters and let total capacity of tank – Q be 1800y liters.
While filling tank – P:
Efficiency of pipe – A $= \frac{1680x}{16} = 105x$ liters/hour
Efficiency of pipe – B $= \frac{1680x}{35} = 48x$ liters/hour
Efficiency of pipe – C $= \frac{1680x}{42} = 40x$ liters/hour
Efficiency of pipe – D $= \frac{1680x}{30} = 56x$ liters/hour
Efficiency of pipe – E $= \frac{1680x}{28} = 60x$ liters/hour
While filling tank – Q:
Efficiency of pipe – A $= \frac{1800y}{25} = 72y$ liters/hour
Efficiency of pipe – B $= \frac{1800y}{40} = 45y$ liters/hour
Efficiency of pipe – C $= \frac{1800y}{18} = 100y$ liters/hour
Efficiency of pipe – D $= \frac{1800y}{24} = 75y$ liters/hour
Efficiency of pipe – E $= \frac{1800y}{30} = 60y$ liters/hour

S81. Ans.(d)
Sol. ATQ, Total capacity of tank – Q $= \frac{100}{3} \times 48x$
$= 1600x$
Now, $1680x - 1600x = 360$
$\Rightarrow x = 4.5$
Required capacity $= 1600x + 1680x = 14760$ liters

S82. Ans.(b)
Sol. When pipe – A, C & E opened alternatively, then:
Pipe – A & C each worked for 10 hours and pipe – E worked for $9\frac{1}{3}$ hours.
Tank – Q filled by pipe – A & E $= 10 \times 72y + \frac{28}{3} \times 60y = 1280y$ liters
Part of tank – Q filled by pipe – C $= 1800y - 1280y$
$= 520y$ liters
Water supplied by pipe – C in 10 hours $= 40x \times 10$
$= 400x$ liters
ATQ,
$520y = 400x$
$x = 1.3y$
Required % $= \frac{1680 \times 1.3y}{1800y} \times 100 = 121\frac{1}{3}\%$

S83. Ans.(b)
Sol. Time taken by C & E together to fill tank – P
$= \frac{1680x}{40x+60x} = 16.8$ hours
Time taken by B & D together to fill tank – Q
$= \frac{1800y}{45y+75y} = 15$ hours
Required % $= \frac{16.8}{15} \times 100 = 112\%$

S84. Ans.(a)
Sol. Time taken by pipe – B & D together to fill tank – Q $= \frac{1800y}{45y+75y} = 15$ hours
ATQ,
Water supplied by pipe – D in 15 hours $= 15 \times 75y$
$3375 = 1125y$
$y = 3$
Total capacity of tank – P $= 1800 \times 3 + 3000 = 8400$ liters
Now, $1680x = 8400$
$\Rightarrow x = 5$
Required quantity of water $= 6 \times (105x + 60x)$
$= 990x = 4950$ liters

S85. Ans.(e)

Sol. Water supplied by pipe – B, C & E together in tank – P in 5 hours

$= 5 \times (48x + 40x + 60x)$

$= 740x$

ATQ, $\frac{740x}{1800y} = \frac{518}{900}$

$\Rightarrow \frac{x}{y} = \frac{7}{5}$ ...(i)

Tank – Q filled by pipe – A in 14 hours $= 14 \times 72y$

$5040 = 1008y$

$\Rightarrow y = 5$

Put value of y in (i):

$x = 7$

Required time $= \frac{8232}{56 \times 7} = 21$ hours

S86. Ans.(e)

Sol. I. $3x^2 - 17x + 20 = 0$

$3x^2 - 12x - 5x + 20 = 0$

$3x(x - 4) - 5(x - 4) = 0$

$x = 4, 5/3$

II. $5y^2 - 28y + 15 = 0$

$5y^2 - 25y - 3y + 15 = 0$

$5y(y - 5) - 3(y - 5) = 0$

$y = 5, ⅗$

∴ No relation

S87. Ans.(e)

Sol. I. $6x^2 - 11x + 4 = 0$

$6x^2 - 8x - 3x + 4 = 0$

$2x(3x - 4) - 1(3x - 4) = 0$

$x = \frac{4}{3}, \frac{1}{2}$

II. $2y^2 - 15y - 8 = 0$

$2y^2 - 16y + y - 8 = 0$

$2y(y - 8) + 1(y - 8) = 0$

$y = 8, \frac{-1}{2}$

∴ No relation

S88. Ans.(a)

Sol. I. $2(x^2 - 6x + 9) = x - 3$

$2x^2 - 12x + 18 - x + 3 = 0$

$2x^2 - 13x + 21 = 0$

$2x^2 - 6x - 7x + 21 = 0$

$2x(x - 3) - 7(x - 3) = 0$

$x = 3, \frac{7}{2}$

II. $5y^2 + 6y + 1 = 0$

$5y^2 + 5y + y + 1 = 0$

$5y(y + 1) + 1(y + 1) = 0$

$y = -1, \frac{-1}{5}$

$x > y$

S89. Ans.(e)

Sol. I. $7x^2 + 61x + 40 = 0$

$7x^2 + 56x + 5x + 40 = 0$

$7x(x + 8) + 5(x + 8) = 0$

$x = -8, \frac{-5}{7}$

II. $5y^2 - 13y - 28 = 0$

$5y^2 - 20y + 7y - 28 = 0$

$5y(y - 4) + 7(y - 4) = 0$

$y = 4, \frac{-7}{5}$

∴ No relation

S90. Ans.(b)

Sol. I. $x^2 - 11x + 24 = 0$

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

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

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

$\therefore x = 3 \; or \; 8$

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

$\Rightarrow 2y^2 - 3y - 6y + 9 = 0$

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

$\Rightarrow (2y - 3)(y - 3)$

$\therefore y = \frac{3}{2} or \; 3$

$x \geq y$

S91. Ans.(d)

Sol. Let total employees in company be 100x and let total male employees in the company be 100y.

ATQ,

$\left(\frac{28}{100} \times 100x - \frac{25}{100} \times 100y\right) - \left(\frac{20}{100} \times 100x - \frac{15}{100} \times 100y\right) = 170$

$28x - 25y - 20x + 15y = 170$

$8x - 10y = 170$ ...(i)

And, $\left(\frac{12}{100} \times 100x - \frac{10}{100} \times 100y\right) + \left(\frac{16}{100} \times 100x - \frac{20}{100} \times 100y\right) = 670$

$12x - 10y + 16x - 20y = 670$

$28x - 30y = 670$ ...(ii)

On solving (i) & (ii), we get:

$x = 40, \; y = 15$

Required male employees $= \frac{30}{100} \times 100 \times 15 = 450$

S92. Ans.(e)

Sol. Let total employees in company be 100x and let total male employees in the company be 100y.

ATQ,

$\left(\frac{20+16}{100} \times 100x\right) - \left(\frac{10+30}{100} \times 100y\right) = 1200$

$36x - 40y = 1200$ ....(i)

Now, female employees in HR department = $\left(\frac{24}{100} \times 100x - \frac{30}{100} \times 100y\right)$

$= 24x - 30y$

Now, $\frac{24x-30y}{\frac{20}{100} \times 100x} = \frac{30}{100}$

$\frac{24x-30y}{20x} = \frac{3}{10}$

$18x = 30y$

$y = 0.6x$ ...(ii)

On solving (i) & (ii), we get:

$x = 100,\ y = 60$

Required male employees = $100 \times 60 = 6000$

S93. Ans.(b)

Sol. Let total employees in company be 100x and let total male employees in the company be 100y.

So, male employees in HR department = $100y \times \frac{30}{100}$

= 30y

And, total employees in Operations department = $100x \times \frac{28}{100}$

= 28x

ATQ,

$\frac{30y}{28x} = \frac{300}{700}$

$x = 2.5y$

Now, female employees in Finance department

$= \left(\frac{12}{100} \times 100x\right) - \left(\frac{10}{100} \times 100y\right)$

$= 12x - 10y$

$= 30y - 10y \quad (x = 2.5y)$

$= 20y$

And, female employees in Operations department

$= \left(\frac{28}{100} \times 100x\right) - \left(\frac{25}{100} \times 100y\right)$

$= 28x - 25y$

$= 70y - 25y \quad (x = 2.5y) = 45y$

Now, $(45y - 20y) = 750$

$y = 30$

And, $x = 75$

Required female employees

$= \left(\frac{24}{100} \times 100 \times 75\right) - \left(\frac{30}{100} \times 100 \times 30\right)$

$= 1800 - 900 = 900$

S94. Ans.(d)

Sol. Let total employees in company be 100x and let total male employees in the company be 100y.

So, total female employees in Operations and Research department together

$= \left(\frac{28}{100} \times 100x - \frac{25}{100} \times 100y\right) + \left(\frac{20}{100} \times 100x - \frac{15}{100} \times 100y\right)$

$= 28x - 25y + 20x - 15y$

$= 48x - 40y$

And, total male employees in Operations and Research department together = $\frac{25+15}{100} \times 100y$

= 40y

ATQ,

$\frac{40y}{48x-40y} = \frac{5}{11}$

$\frac{x}{y} = \frac{8}{3}$

Let x & y be 8a & 3a respectively.

Now, $\left(\frac{24}{100} \times 100 \times 8a\right) - \left(\frac{30}{100} \times 100 \times 3a\right)$

$= 510$

$a = 5$

Hence, total male employees in the company

$= 100 \times 3 \times 5 = 1500$

And, total female employees in the company = $100 \times 8 \times 5 - 1500 = 2500$

Required difference = $2500 - 1500 = 1000$

S95. Ans.(e)

Sol. Let total employees in company be 100x and let total male employees in the company be 100y.

ATQ,

$\left(\frac{1}{3} \times \frac{(20+16+24)}{100} \times 100x\right) - \left(\frac{1}{3} \times \frac{25+15+20}{100} \times 100y\right) = 200$

$20x - 20y = 200$

$x - y = 10$ ...(i)

Now, female employees in Research department

$= \left(100x \times \frac{20}{100}\right) - \left(100y \times \frac{15}{100}\right) = 20x - 15y$

And, male employees in Research department

$= \left(100y \times \frac{15}{100}\right) = 15y$

Now,
$20x - 15y - 15y = 50$
$2x - 3y = 5$ ...(ii)
On solving (i) & (ii), we get:
$x = 25,\ y = 15$
So, required employees = $100x$ = 2500

S96. Ans.(e)
Sol. Let the distance covered in one way be x km and the time taken to cover both way distance be 't' hr.
ATQ
$\frac{x}{40} + \frac{x}{30} = t$
$7x = 120t$
Since x has an integral value & t < 6; which means t should be divisible by 7
So, possible Value of t will be= 0.7/1.4/2.1/2.8/3.5/4.2/4.9/5.6
So, possible value of distance which are divisible by 8= 24 km, 48 km and 72 km

S97. Ans.(b)
Sol. Let the quantity of milk and that of water be 2a lit and 5a lit respectively.
ATQ
$\frac{2a+x}{5a} = \frac{2}{3}$
$4a = 3x \ldots\ldots\ldots (i)$
And $\frac{2a+x}{5a+20} = \frac{1}{2}$
$2x - a = 20 \ldots\ldots\ldots\ldots (ii)$
From (i) and (ii),
x = 16 lit

S98. Ans.(d)
Sol. Let the cost price of each article be Rs x
Profit % on first article= $\frac{320-x}{x} \times 100$
Profit % on second article= $\frac{320-x}{320} \times 100$
ATQ, $\frac{\frac{320-x}{x}\times 100}{\frac{320-x}{320}\times 100} = \frac{8}{5}$
$x = 200$
Profit earned by Veer on first article= Rs 120
Profit earned by Ayush on first article= Rs 96
Z=320+96= Rs 416

S99. Ans.(c)
Sol. Let the total work be 60 units (LCM of 12 days and 15 days)
Efficiency of Shivam= 5 units/ day
Efficiency of Maanik= 4 units/day
Time taken by Shivam & Maanik together= $\frac{60}{9} = 6\frac{2}{3}$ days
Work done in 4 days= 36 units
Work done in 2 days by Maanik= 8 units
Remaining work= 16 units
Remaining time= $\left(6\frac{2}{3} + 2\right) - 6 = 2\frac{2}{3}$ days
Efficiency of Veer= $\frac{16}{2\frac{2}{3}} - 4 = 2$ units/day
Required time taken by Veer alone to do the work= 30 days

S100. Ans.(e)
Sol. Let the initial rate be x% per annum.
Interest received from the first sum= $\frac{1725\times 1\times x}{100}$ = Rs 17.25x
Interest received from the second sum= $\frac{1075\times(x+7)\times 8}{100\times 12} = \text{Rs}\frac{43}{6}(x+7)$
ATQ
$17.25x - \frac{43}{6}(x+7) = 30.5$
x =8 %
Required rate of interest= 15%