Averages and Percentage Questions for SSC CHSL and MTS

Questions

Instructions

For the following questions answer them individually

Question 1

A fruit seller has a sale of ₹10,435, ₹9,927,₹10,855 ₹10,230 and ₹9,562 for five consecutive months.How much sale (in ₹) must he have in the sixth month so that he gets an average sale of ₹10,500?

A 9,231

B 8,231

C 8,991

D 11,991

Answer: D

Explanation:

As we know,

Average = $\frac{Sum of observation}{total\ number\ of\ observation}$

Let the sale of 6th month be x

Average = $\frac{(10435+9927+10855+10230+9562+x)}{6} = 10500$

= $51009 + x = 63000$

x = 11991

Hence, option D is correct.

Question 2

The mean of 100 items is 47.It was discovered that three items which should have been 60, 70, 80 were wrongly read as 40, 20, 50, respectively. The correct mean is:

A 48

B 47

C 50

D 51

Answer: A

Explanation:

Given,

Mean of 100 items = 47

Sum of observation = $mean \times number\ of\ observation$

i.e; $47 \times 100 = 4700$

Correct sum = 4700 + (60 + 70 + 80) - (40 + 20 + 50)

i.e; 4800

Correct mean = $\frac{Correct\ sum}{number\ of\ observation}$

i.e $\frac{4800}{100} = 48$

Hence, Option A is correct

Question 3

The average weight of 6 people increased by 2.5 kg when a new person came in place of other person weighing 55 kg. what can be the weight of new person (in kg)?

A 70

B 62.5

C 60

D 75.5

Answer: A

Explanation:

Total weight increased = number of persons $\times$ increased weight

i.e;$6 \times 2.5 = 15$

Weight of new person = weight of replaced person + Total increased weight

i.e; 55 + 15 = 70 kg

Hence, Option A is correct.

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Question 4

A girl spends 76% of her income. If her income increases by 18% and her expenditure increases by 25%,then what is the percentage increase or decrease in her savings (correct to one decimal place)?

A 6.9%, decrease

B 4.2%, decrease

C 5.7%, increase

D 8.4%, increase

Answer: B

Explanation:

Let the income of girl is 100

Expenditure is 76% of income

i.e, $\frac{76}{100} \times 100$

= 76

Saving = Income - expenditure

100 - 76 = 24

According to question,

income is increased by 18%

Increased income = $\frac{18}{100} \times 100 + 100 = 118$

Expenditure is increased by 25%

increased expenditure = $\frac{25}{100} \times 76 + 76 = 95$

New saving = 118 - 95 = 23

% decrease in saving = $\frac{(24-23)}{24} \times 100$

i.e; $4.16 \simeq 4.2\,\%$

Hence, Option B is correct.

Question 5

The average of eleven numbers is 56. The average of first three numbers is 52 and that of next five numbers is 60. The 9th and 10th number are 3 and 1 more than the 11th number respectively. What is the average of 9th and 11th numbers?

A 53.5

B 52

C 52.5

D 54

Answer: A

Explanation:
The average of first three numbers is 52.

Sum of the first three numbers = 52 x 3 = 156

The average of next five numbers is 60.

Sum of the next five numbers = 60 x 5 = 300

Let the 11th number be 'n'.

The average of eleven numbers is 56.

Sum of the eleven numbers = 56 x 11 = 616

156 + 300 + (n + 3) + (n + 1) + n = 616

3n + 460 = 616

3n = 156

n = 52

Average of 9th and 11th numbers = $\frac{(n+3)+n}{2}$

= $\frac{107}{2}$

= 53.5

Hence, the correct answer is Option A

Question 6

The total number of students in a school is 1400, out of which 35% of the students are girls and the rest are boys. If 80% of the boys and 90% of the girls passed in an annual examination, then the percentage of the students who failed is:

A 16.5

B 21.5

C 17.4

D 15.8

Answer: A

Explanation:
Total number of students in a school is 1400.

35% of the students are girls and the rest are boys.

Number of girls = $\frac{35}{100} \times 1400$ = 490

Number of boys = 1400 - 490 = 910

80% of the boys and 90% of the girls passed in an annual examination.

Number of students passed in the examination = $\frac{80}{100} \times 910 + \frac{90}{100} \times 490 = 728 + 441$ = 1169

Number of students failed in the examination = 1400 - 1169 = 231

Percentage of the students failed in the examination = $\frac{231}{1400} \times 100$

= 16.5%

Hence, the correct answer is Option A

Question 7

The average of 23 numbers is 51. The average of first 12 numbers is 49 and the average of last 12 numbers is 54. If the twelfth number is removed, then the average of the remaining numbers (correct to two decimal places) is:

A 53:25

B 50.45

C 51.75

D 52.65

Answer: B

Explanation:
The average of 23 numbers is 51.

Sum of the 23 numbers = 51 x 23 = 1173.....(1)

The average of first 12 numbers is 49.

Sum of the first 12 numbers = 49 x 12 = 588

Sum of the first 11 numbers + 12th number = 588.....(2)

The average of last 12 numbers is 54.

Sum of the last 12 numbers = 54 x 12 = 648

12th number + Sum of the last 11 numbers = 648.....(3)

Adding (2) and (3),

Sum of the first 11 numbers + 12th number + 12th number + Sum of the last 11 numbers = 588 + 648

(Sum of the first 11 numbers + 12th number + Sum of the last 11 numbers) + 12th number = 1236

Sum of the 23 numbers + 12th number = 1236

1173 + 12th number = 1236

12th number = 63

Required average = $\frac{1173-63}{22}$

= 50.4545

Hence, the correct answer is Option B

Question 8

The average weight of a certain number of students in a class is 55.5 kg. If 4 students with average weight 60 kg join the class, then the average weight of all students in the class increases by 360 g. The number of students in the class, initially, is:

A 46

B 31

C 41

D 36

Answer: A

Explanation:
Let the initial number of students = n

Average of the weight of 'n' students = 55.55

Sum of the weight of 'n' students = 55.55n

Sum of the weight of 4 students = 60 x 4 = 240 kg

According to the problem,

$\frac{55.55n+240}{n+4} = 55.55 + \frac{360}{1000}$

$\frac{55.55n+240}{n+4} = 55.55 + 0.36$

$\frac{55.55n+240}{n+4} = 55.86$

55.55n + 240 = 55.86n + 223.44

0.36n = 16.56

n = 46

The initial number of students = n = 46

Hence, the correct answer is Option A

Question 9

The average monthly salary of 60 employees of a factory is ₹29900. If two officers are getting ₹90000 each and the average salary of 8 supervisors is ₹65000, then what is the average salary (in ₹) of the remaining employees?

A 22680

B 29080

C 21080

D 21880

Answer: D

Explanation:
The average monthly salary of 60 employees of the factory is ₹29900.

Total monthly salary of 60 employees of the factory = 29900 x 60 = ₹1794000

Two officers are getting ₹90000 each.

Sum of the salary of two officers = 2 x 90000 = ₹180000

The average salary of 8 supervisors is ₹65000.

Total salary of 8 supervisors = 65000 x 8 = ₹520000

Total salary of remaining 50 employees of the factory = 1794000 - 180000 - 520000 = ₹1094000

Average of remaining 50 employees of the factory = $\frac{1094000}{50}$ = ₹21880

Hence, the correct answer is Option D

Question 10

Weight of A is 20% more than weight of B, whose weight is 30% more than weight of C. By how much percent weight of A is more than weight of C?

A 44

B 56

C 69

D 35.89

Answer: B

Explanation:
Weight of B is 30% more than weight of C.

$B = \frac{130}{100} \times C$

Weight of A is 20% more than weight of B.

$A = \frac{120}{100} \times B = \frac{120}{100} \times \frac{130}{100} \times C = \frac{156}{100} C$

Required percentage = $\frac{\frac{156}{100}C - C}{C} \times 100$

$= \frac{56}{100} \times 100$

= 56%

Hence, the correct answer is Option B

Question 11

The average of four consecutive even numbers is 27. By adding which number does the average become 28?

A 32

B 30

C 33

D 29

Answer: A

Explanation:
Let the four consecutive even numbers are a, a+2, a+4, a+6

Average of four consecutive even numbers is 27

$\Rightarrow \frac{a+a+2+a+4+a+6}{4} = 27$

$\Rightarrow \frac{4a+12}{4} = 27$

$\Rightarrow a + 3 = 27$

$\Rightarrow a = 24$

The four consecutive even numbers are 24, 26, 28, 30

Let the number which is to be added = p

After adding p, the new average is 28

$\Rightarrow \frac{24+26+28+30+p}{5} = 28$

$\Rightarrow 108 + p = 140$

$\Rightarrow p = 32$

∴ The required number which is to be added is 32

Hence, the correct answer is Option A

Question 12

Several students have taken an exam. There was an error in the answer key which affected the marks of 48 students, and their average marks reduced from 78 to 66. The average of remaining students increased by 3.5 marks. This resulted the reduction of the average of all students by 4.5 marks. The number of students that attended the exam is:

A 96

B 84

C 100

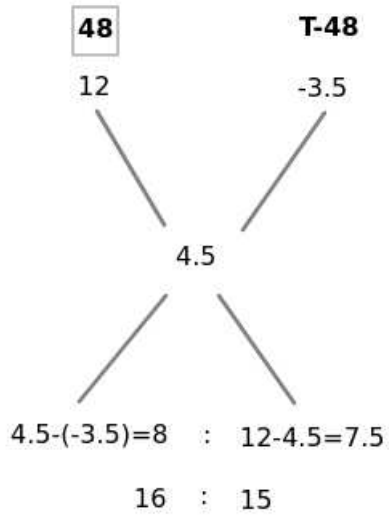
D 93

Answer: D

Explanation:
Let the total number of students = T

Number of students whose average is reduced = 48

Number of students whose average is increased = T-48



Using Alligation and Mixture rule,

Ratio of 48 and T-48 = 16 : 15

=> $\frac{48}{T-48} = \frac{16}{15}$

=> T-48 = 45

=> T = 93

∴ Total number of students = 93

Hence, the correct answer is Option D

Another method

Let the total number of students = T

Without error

Average of 48 students = 78

Sum of 48 students = 78 x 48

Let average of remaining T-48 students = p

Sum of T-48 students = p(T-48)

Total marks = (78 x 48) + p(T-48)

Let the average of total students = q

⇒ (78 x 48) + p(T-48) = Tq.....(1)

With error

Average of 48 students = 66

Sum of 48 students = 66 x 48

Average of T-48 students = (p+3.5)

Sum of T-48 students = (p+3.5)(T-48)

Total marks = (66 x 48)+(p+3.5)(T-48)

Average of total students = (q-4.5)

⇒ (66 x 48)+(p+3.5)(T-48) = T(q-4.5)

⇒ (66 x 48)+(p+3.5)(T-48) = Tq - 4.5T

⇒ (66 x 48)+(p+3.5)(T-48) = (78 x 48) + p(T-48) - 4.5T [From (1)]

⇒ (p+3.5)(T-48) - p(T-48) + 4.5T = (78 x 48) - (66 x 48)

⇒ (T-48)(p+3.5-p) + 4.5T = 48(78 - 66)

⇒ (T-48)3.5 + 4.5T = 48 x 12

⇒ 3.5T - 48 x 3.5 + 4.5T = 48 x 12

⇒ 8T = 48 x 15.5

⇒ T = 93

Total number of students = 93

Hence, the correct answer is Option D

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Question 13

A shopkeeper pays 12% of the cost price as tax while purchasing an item whose cost is ₹ 500. He wants to earn a profit of 20% after giving a discount of 16% on the marked price. So, the marked price should be:

A ₹800

B ₹780

C ₹960

D ₹840

Answer: A

Explanation:
Given,

Cost of the item = ₹ 500

Tax% = 12%

Cost price of the shopkeeper = $500 + \frac{12}{100} \times 500$ = ₹ 560

Profit% = 20%

Selling price of the item = $\frac{120}{100} \times 560$ = ₹ 672

Let the Marked price = M

Discount% = 16%

$\Rightarrow \frac{84}{100} \times M = 672$

$\Rightarrow M = 800$

∴ Marked price = ₹ 800

Hence, the correct answer is Option A

Question 14

The average daily production of toys in a factory in the month of December is 512. If the average production during first 20 days is 515 and that of the last 13 days is 510, then what is the average of production on 19 and 20 December?

A 1058

B 513

C 529

D 512

Answer: C

Explanation:

The average daily production of toys in a factory in the month of December is 512.

Total production of toys in the month of December = 512 x 31 = 15872.....(1)

The average production during first 20 days is 515.

Total production during first 20 days = 515 x 20 = 10300

Production during first 18 days + 19 December + 20 December = 10300.....(2)

The average production during last 13 days is 510.

Total production during last 13 days = 510 x 13 = 6630

19 December + 20 December + Production during last 11 days = 6630.....(3)

Solving (2) + (3) - (1), we get

19 December + 20 December = 10300 + 6630 - 15872

19 December + 20 December = 1058

Total production on 19 and 20 December = 1058

Average of production on 19 and 20 December = $\frac{1058}{2}$ = 529

Hence, the correct answer is Option C

Question 15

A woman earns ₹ 1,000/day. After some weeks, she earns ₹1,160/day. By how much percentage did her earnings increase?

A 18%

B 16%

C 17%

D 15%

Answer: B

Explanation:
Increase in earnings of the woman = 1160 - 1000 = ₹ 160/day

∴ Percentage increase in earnings of the woman = $\frac{160}{1000} \times 100 = 16\%$

Hence, the correct answer is Option B

Question 16

The average of 40 numbers is 36. The average of the first 25 numbers is 31 and the average of last 16 numbers is 43. Find the 25th number.

A 21

B 23

C 24

D 22

Answer: B

Explanation:
Given, average of 40 numbers = 36

⇒ Sum of 40 numbers = 36 x 40 = 1440.....(1)

The average of the first 25 numbers is 31

⇒ Sum of first 25 numbers = 31 x 25 = 775

⇒ Sum of first 24 numbers + 25th number = 775 .....(2)

The average of last 16 numbers is 43

⇒ Sum of last 16 numbers = 43 x 16 = 688 .....(3)

Adding equations (2) and (3),

Sum of first 24 numbers + 25th number + Sum of last 16 numbers = 775 + 688

⇒ Sum of first 24 numbers + Sum of last 16 numbers + 25th number = 1463

⇒ Sum of 40 numbers + 25th number = 1463

⇒ 1440 + 25th number = 1463

⇒ 25th number = 23

Hence, the correct answer is Option B

Question 17

Malti bought a TV for ₹ 8,800 including GST at 10%. What is the original cost of the TV?

A ₹8,800

B ₹8,000

C ₹7,920

D ₹9,600

Answer: B

Explanation:

Let the original cost of the TV = C

Cost of TV with 10% GST = $\frac{110}{100}$C

Given, Cost of TV with 10% GST = ₹ 8,800

$\Rightarrow \frac{110}{100}$C = 8800

$\Rightarrow$ C = 8000

$\therefore$ The original cost of the TV = ₹ 8,000

Hence, the correct answer is Option B

Question 18

The average of 24 numbers is 26. The average of the first 15 numbers is 23 and that of the last 8 number is 33. Find the 16th number.

A 16

B 17

C 15

D 18

Answer: C

Explanation:

Given, the average of the first 15 numbers is 23

$\Rightarrow$ Sum of first 15 numbers = 23 x 15 = 345

Average of last 8 numbers is 33

$\Rightarrow$ Sum of last 8 numbers = 33 x 8 = 264

Average of 24 numbers is 26

$\Rightarrow$ Sum of 24 numbers = 26 x 24 = 624

$\Rightarrow$ Sum of first 15 numbers + 16th number + Sum of last 8 numbers = 624

$\Rightarrow$ 345 + 16th number + 264 = 624

$\Rightarrow$ 16th number = 15

Hence, the correct answer is Option C

Question 19

Ravinder invests ₹ 3,750 which is equal to 15% of his monthly salary in a medical insurance policy. Later he invests 25% and 8% of his monthly salary on a child education policy, and mutual funds, respectively. The total amount left with him is:

A ₹ 15,000

B ₹ 8,000

C ₹ 12,000

D ₹ 13,000

Answer: D

Explanation:

Let the monthly salary of Ravinder = M

Amount invested in medical insurance policy = ₹ 3,750

Percentage of amount invested in medical insurance policy = 15%

$\Rightarrow \frac{15}{100}M = 3750$

$\Rightarrow$ M = 25000

Monthly salary of Ravinder = ₹ 25,000

Percentage of salary left with him after investing in medical insurance policy, child education policy and mutual funds = 100 - 15 - 25 - 8 = 52%

$\therefore$ Total amount left with him = $\frac{52}{100} \times 25000$ = ₹ 13,000

Hence, the correct answer is Option D