



Number System Questions for SSC CHSL and MTS

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Questions

Instructions

For the following questions answer them individually

Question 1

The value of $5\frac{5}{29} - \left[\frac{15}{4} \div \left\{ \frac{3}{4} \times \left(\frac{3}{2} - \frac{1}{5} - \frac{1}{3} \right) \right\} \right]$ is:

- A 5
- B 1
- C 0
- D 10

Answer: C

Explanation:

According to the rule of BODMAS,

Parts of an equation enclosed in a 'brackets' must be solved first.

$$5\frac{5}{29} - \left[\frac{15}{4} \div \left\{ \frac{3}{4} \times \left(\frac{45-6-10}{30} \right) \right\} \right]$$

$$5\frac{5}{29} - \left[\frac{15}{4} \div \left\{ \frac{3}{4} \times \frac{29}{30} \right\} \right]$$

$$5\frac{5}{29} - \left[\frac{15}{4} \div \frac{29}{40} \right]$$

$$5\frac{5}{29} - \frac{150}{29}$$

$$\frac{150}{29} - \frac{150}{29}$$

$$= 0$$

Question 2

Find the greatest value of b so that 30a68b (a > b) is divisible by 11.

- A 4
- B 9
- C 3
- D 6

Answer: C

Explanation:

Given, 30a68b is divisible by 11.

$\Rightarrow (3 + a + 8) - (0 + 6 + b)$ will be multiple of 11.

$\Rightarrow (a - b + 5)$ will be multiple of 11.

$\Rightarrow (a - b + 5) = 0$ or $(a - b + 5) = 11$ or $(a - b + 5) = 22$ so on.

$\Rightarrow a - b = -5$ or $a - b = 6$ or $a - b = 17$ so on.

Since $a > b$, $a - b$ cannot be negative.

Both a and b are digits, so $a - b$ cannot be a two digit number.

The only possibility is

$$a - b = 6$$

The pairs satisfying the above equation are (9,3), (8,2), (7,1), (6,0).

The greatest value of b can be 3.

Hence, the correct answer is Option C

Question 3

The sum of 3-digit numbers abc, cab and bca is not divisible by:

- A 37
- B 3
- C 31
- D $a + b + c$

Answer: C

Explanation:

$$\text{Sum of the numbers} = (100a + 10b + c) + (100c + 10a + b) + (100b + 10c + a)$$

$$= 100(a + b + c) + 10(a + b + c) + (a + b + c)$$

$$= 111(a + b + c)$$

$$= 37 \times 3 \times (a + b + c)$$

Sum is not divisible by 31.

Hence, the correct answer is Option C

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Question 4

What is the sum of the digits of the largest five digit number which is divisible by 5, 35, 39 and 65?

- A 30
- B 33
- C 27
- D 35

Answer: B

Explanation:

$$\text{LCM of 5, 35, 39 and 65} = 1365$$

When the largest five digit number 99999 is divided by 1365, the remainder will be 354.

So, $99999 - 354 = 99645$ is the largest five digit number divisible by 5, 35, 39 and 65.

$$\text{Sum of the digits} = 9 + 9 + 6 + 4 + 5 = 33$$

Hence, the correct answer is Option B

Question 5

What is the value of k such that number 72k460k is divisible by 6?

- A 4
- B 7

C 9

D 8

Answer: A

Explanation:

Given, $72k460k$ is divisible by 6.

$72k460k$ is divisible by both 2 and 3.

So, k is even and sum of the digits is divisible by 3.

$(7 + 2 + k + 4 + 6 + 0 + k = 19 + 2k)$ is divisible by 3.

since k is even, the only possibility is $k = 4$.

Hence, the correct answer is Option A

Question 6

When a number is divided by 14, the remainder is 9. If the square of the same number is divided by 14, then the remainder will be:

A 11

B 9

C 8

D 10

Answer: A

Explanation:

Given, When the number is divided by 14, the remainder is 9

Let the number $= 14k + 9$

Square of the number $= (14k + 9)^2$

$$= 196k^2 + 252k + 81$$

$$= 196k^2 + 252k + 70 + 11$$

$$= 14(14k^2 + 18k + 5) + 11$$

$$= 14p + 11$$

\therefore When the square of the number is divided by 14, the remainder is 11

Hence, the correct answer is Option A

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Question 7

If $4M37094267N$ is divisible by both 8 and 11, where M and N are single digit integers, then the values of M and N are:

A $M = 5, N = 6$

B $M = 5, N = 4$

C $M = 5, N = 2$

D $M = 2, N = 5$

Answer: C

Explanation:

Given, $4M37094267N$ is divisible by both 8 and 11

If the number is divisible by 8, then the three digits should be divisible by 8

$\Rightarrow 67N$ is divisible by 8

\Rightarrow The only possible value for N is 2

If the number is divisible by 11, then

Sum of digits at odd place - Sum of digits at even place = 0 or multiple of 11

$\Rightarrow (M+7+9+2+7) - (4+3+0+4+6+N) = 0$ or multiple of 11

$\Rightarrow M + 25 - 17 - N = 0$ or multiple of 11

$\Rightarrow M - N + 8 = 0$ or multiple of 11

$\Rightarrow M - 2 + 8 = 0$ or multiple of 11

$\Rightarrow M + 6 = 0$ or multiple of 11

The possible value is $M + 6 = 11$

$\Rightarrow M = 5$

$\therefore M = 5, N = 2$

Hence, the correct answer is Option C

Question 8

Which number is divisible by both 9 and 11?

A 10,098

B 10,108

C 10,089

D 10,087

Answer: A

Explanation:

If a number is divisible by 9, then the sum of the digits of the number should be divisible by 9.

If a number is divisible by 11, then the difference of sum of the alternate numbers should be divisible by 11.

By Trial and Error method,

Option A

Sum of the digits of 10,098 = $1 + 0 + 0 + 9 + 8 = 18$ which is divisible by 9. So 10,098 is divisible by 9.

Difference of sum of alternate digits = $1 + 0 + 8 - (0 + 9) = 0$ which is divisible by 11. So 10,098 is divisible by 11.

Hence, the correct answer is Option A

Question 9

If the 8-digit number $43A5325B$ is divisible by 8 and 9, then the sum of A and B is equal to:

A 15

B 14

C 12

D 18

Answer: B

Explanation:

Given, 8-digit number 43A5325B is divisible by 8 and 9

If the number is divisible by 8, then the last three digits should be divisible by 8

$\Rightarrow 25B$ is divisible by 8

$\Rightarrow B = 6$

If the number is divisible by 9, then the sum of the digits of the number should be divisible by 9

$\Rightarrow 4 + 3 + A + 5 + 3 + 2 + 5 + B = \text{multiple of } 9$

$\Rightarrow 22 + A + B = \text{multiple of } 9$

$\Rightarrow 22 + A + 6 = \text{multiple of } 9$

$\Rightarrow 28 + A = \text{multiple of } 9$

The only possible value of A is 8

\therefore Sum of A and B = $8 + 6 = 14$

Hence, the correct answer is Option B

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Question 10

Find the value of $\sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \dots \infty}}}}$

A 4

B 6

C 5

D 3

Answer: B

Explanation:

Let $\sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \dots \infty}}}} = a$

$\Rightarrow \sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \dots \infty}}}} = a$

$\Rightarrow \sqrt{30 + a} = a$

$\Rightarrow 30 + a = a^2$

$\Rightarrow a^2 - a - 30 = 0$

$\Rightarrow a^2 - 6a + 5a - 30 = 0$

$\Rightarrow a(a - 6) + 5(a - 6) = 0$

$\Rightarrow (a - 6)(a + 5) = 0$

$\Rightarrow a - 6 = 0$ or $a + 5 = 0$

$\Rightarrow a = 6$ or $a = -5$

a cannot be negative

$\Rightarrow a = 6$

$$\therefore \sqrt{30 + \sqrt{30 + \sqrt{30 + \sqrt{30 + \dots \infty}}}} = 6$$

Hence, the correct answer is Option B

Question 11

If a positive integer n is divided by 7, the remainder is 2. Which of the numbers in the options yields a remainder of 0 when it is divided by 7?

A $n + 3$

B $n + 5$

C $n + 2$

D $n + 1$

Answer: B

Explanation:

Given, when 'n' is divided by 7 the remainder is 2.

Let $n = 7k + 2$ where k is an positive integer

By Trial and Error method,

Option A

$$n + 3 = 7k + 2 + 3 = 7k + 5$$

\Rightarrow When $n + 3$ is divided by 7, the remainder is 5.

Option B

$$n + 5 = 7k + 2 + 5 = 7k + 7 = 7(k+1)$$

\Rightarrow When $n + 5$ is divided by 7, the remainder is 0.

Hence, the correct answer is Option B

Question 12

The sum of the number of male and female students in an institute is 100. If the number of male students is x , then the number of female students becomes $x\%$ of the total number of students. Find the number of male students.

A 65

B 50

C 60

D 45

Answer: B

Explanation:

Given, number of male students = x

Number of female students = $x\%$ of total students

Total number students = 100

$$\Rightarrow x + \frac{x}{100} \times 100 = 100$$

$$\Rightarrow x + x = 100$$

$$\Rightarrow x = 50$$

\therefore Number of male students = 50

Hence, the correct answer is Option B

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Question 13

Which of the following numbers is divisible by 2, 5 and 10?

- A 7,20,345
- B 149
- C 19,400
- D 1,25,372

Answer: C

Explanation:

From the options,

7,20,345 is not divisible by 2 because the units place is not an even number

149 is not divisible by 2 because the units place is not an even number

1,25,372 is not divisible by 10 because the units place is not zero

19,400 is divisible by 2,5,10 as it is even number and the units place is zero

Hence, the correct answer is Option C

Question 14

The sum of two numbers is 59 and their product is 840. Find the sum of their squares.

- A 2961
- B 1801
- C 1875
- D 1754

Answer: B

Explanation:

Let the two numbers are a and b

Given,

Product of the numbers = 840

$$\Rightarrow ab = 840$$

Sum of the numbers = 59

$$\Rightarrow a + b = 59$$

$$\Rightarrow (a + b)^2 = 59^2$$

$$\Rightarrow a^2 + b^2 + 2ab = 3481$$

$$\Rightarrow a^2 + b^2 + 2(840) = 3481$$

$$\Rightarrow a^2 + b^2 + 1680 = 3481$$

$$\Rightarrow a^2 + b^2 = 3481 - 1680$$

$$\Rightarrow a^2 + b^2 = 1801$$

∴ Sum of their squares = 1801

Hence, the correct answer is Option B

Question 15

If the difference between two numbers is 6 and the difference between their squares is 60, what is the sum of their cubes ?

A 894

B 945

C 678

D 520

Answer: D

Explanation:

Let the two numbers are a,b

Difference between two numbers = 6

$$\Rightarrow a - b = 6 \dots\dots\dots(1)$$

Difference between their squares = 60

$$\Rightarrow a^2 - b^2 = 60$$

$$\Rightarrow (a + b)(a - b) = 60$$

$$\Rightarrow (a + b)(6) = 60$$

$$\Rightarrow a + b = 10 \dots\dots\dots(2)$$

Solving (1) and (2)

$$2a = 16$$

$$\Rightarrow a = 8$$

Substituting $a = 8$ in equation(2)

$$\Rightarrow 8 + b = 10$$

$$\Rightarrow b = 2$$

$$\therefore \text{Sum of their cubes} = a^3 + b^3 = 8^3 + 2^3 = 512 + 8 = 520$$

Hence, the correct answer is Option D

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Question 16

Which of the following numbers is divisible by 9?

A 734895

B 594327

C 346217

D 897342

Answer: A

Explanation:

If a number is divisible by 9 then sum of the digits of the number should be divisible by 9

Sum of the digits of 734895 = $7+3+4+8+9+5 = 36$

Sum of the digits of 594327 = $5+9+4+3+2+7 = 30$

Sum of the digits of 346217 = $3+4+6+2+1+7 = 23$

Sum of the digits of 897342 = $8+9+7+3+4+2 = 33$

Sum of the digits of 734895 is divisible by 9 then the number 734895 is divisible by 9

Hence, the correct answer is Option A

Question 17

Find one-fifth of three-eighth of one-third of 11760.

A 294

B 645

C 467

D 598

Answer: A

Explanation:

$$\begin{aligned}\text{One-fifth of three-eighth of one-third of 11760} &= \frac{1}{5} \times \frac{3}{8} \times \frac{1}{3} \times 11760 \\ &= \frac{1}{5} \times 1470 = 294\end{aligned}$$

Question 18

The difference between a number and one-third of that number is 228. What is 20% of that number?

A 72.5

B 68.4

C 58.9

D 61.8

Answer: B

Explanation:

Let the number = a

Given,

The difference between a number and one-third of that number = 228

$$\Rightarrow a - \frac{a}{3} = 228$$

$$\Rightarrow \frac{3a-a}{3} = 228$$

$$\Rightarrow \frac{2a}{3} = 228$$

$$\Rightarrow a = 342$$

$$\therefore 20\% \text{ of the number} = \frac{20}{100} \times a = \frac{20}{100} \times 342 = 68.4$$

Hence, the correct answer is Option B

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Question 19

If a number is divided by 3, the remainder will be 2. If the number is added by 5 and then divided by 3, then what will be the remainder?

- A 0
- B 1
- C 2
- D 3

Answer: B

Explanation:

Let the number be ' a '

When a is divided by 3, the remainder is 2 and let the quotient be k

$$\Rightarrow a = 3k + 2$$

$$\Rightarrow a + 5 = 3k + 2 + 5$$

$$\Rightarrow a + 5 = 3k + 7$$

$$\Rightarrow a + 5 = 3k + 6 + 1$$

$$\Rightarrow a + 5 = 3(k+2) + 1$$

\therefore When $a + 5$ is divided by 3 then the remainder is 1

Hence, the correct answer is Option B

Question 20

Which of the following numbers is divisible by 4?

- A 897654
- B 954782
- C 674536
- D 267834

Answer: C

Explanation:

If a number is divisible by 4 then the last two digits of the number should be divisible by 4

In 897654, the last two digits of the number 54 is not divisible by 4 then the number 897654 is not divisible by 4

In 954782, the last two digits of the number 82 is not divisible by 4 then the number 954782 is not divisible by 4

In 674536, the last two digits of the number 36 is divisible by 4 then the number 674536 is divisible by 4

In 267834, the last two digits of the number 34 is not divisible by 4 then the number 267834 is not divisible by 4

Hence, the correct answer is Option C

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