Exercise 2B

(iv) 467*91

Sum of the digits at odd places $1 + * + 6 = 7 + *$

Sum of the digits at even places $9 + 7 + 4 = 20$

Difference = sum of odd terms − sum of even terms

$= (7 + *) - 20$

$= * - 13$

Now, $(* - 13)$ will be divisible by 11 if $* = 2$.

i.e., $2 - 13 = -11$

-11 is divisible by 11.

$\therefore * = 2$

Hence, the number is 467291.

(v) 1723*4

Sum of the digits at odd places $4 + 3 + 7 = 14$

Sum of the digits at even places $* + 2 + 1 = 3 + *$

Difference = sum of odd terms − sum of even terms

$= 14 - (3 + *)$

$= 11 - *$

Now, $(11 - *)$ will be divisible by 11 if $* = 0$.

i.e., $11 - 0 = 11$

11 is divisible by 11.

$\therefore * = 0$

Hence, the number is 172304.

(vi) 9*8071

Sum of the digits at odd places $1 + 0 + * = 1 + *$

Sum of the digits at even places $7 + 8 + 9 = 24$

Difference = sum of odd terms − sum of even terms

$= 1 + * - 24$

$= * - 23$

Now, $(* - 23)$ will be divisible by 11 if $* = 1$.

i.e., $1 - 23 = -22$

-22 is divisible by 11.

$\therefore * = 1$

Hence, the number is 918071.

Q14

Answer :

(i) 10000001 by 11
10000001 is divisible by 11.
Sum of digits at odd places = (1 + 0 + 0 + 0) = 1
Sum of digits at even places = (0 + 0 + 0 + 1) = 1
Difference of the two sums = (1 − 1) = 0, which is divisible by 11.

(ii) 19083625 by 11
19083625 is divisible by 11.
Sum of digits at odd places = (5 + 6 + 8 + 9) = 28
Sum of digits at even places = (2 + 3 + 0 + 1) = 6
Difference of the two sums = (28 − 6) = 22, which is divisible by 11.

(iii) 2134563 by 9
2134563 is not divisible by 9.
It is because the sum of its digits, 2 + 1 + 3 + 4 + 5 + 6 + 3, is 24, which is not divisible by 9.

(iv) 10001001 by 3
10001001 is divisible by 3.
It is because the sum of its digits, 1 + 0 + 0 + 0 + 1 + 0 + 0 + 1, is 3, which is divisible by 3.

(v) 10203574 by 4
10203574 is not divisible by 4.
It is because the number formed by its tens and the ones digits is 74, which is not divisible by 4.
(vi) 12030624 by 8
12030624 is divisible by 8.
It is because the number formed by its hundreds, tens and ones digits is 624, which is divisible by 8.

Q15
Answer :

A number between 100 and 200 is a prime number if it is not divisible by any prime number less than 15.
Similarly, a number between 200 and 300 is a prime number if it is not divisible by any prime number less than 20.

(i) 103 is a prime number, because it is not divisible by 2, 3, 5, 7, 11 and 13.
(ii) 137 is a prime number, because it is not divisible by 2, 3, 5, 7 and 11.
(iii) 161 is a not prime number, because it is divisible by 7.
(iv) 179 is a prime number, because it is not divisible by 2, 3, 5, 7, 11 and 13.
(v) 217 is a not prime number, because it is divisible by 7.
(vi) 277 is a prime number, because it is not divisible by 2, 3, 5, 7, 11, 13, 17 and 19.
(vii) 331 is a prime number, because it is not divisible by 2, 3, 5, 7, 11, 13, 17 and 19.
(viii) 397 is a prime number, because it is not divisible by 2, 3, 5, 7, 11, 13, 17 and 19.

Q16

Answer :

(i) 14 is divisible by 2, but not by 4.
(ii) 12 is divisible by 4, but not by 8.
(iii) 24 is divisible by both 2 and 8, but not by 16.
(iv) 30 is divisible by both 3 and 6, but not by 18.

Q17

Answer :

(i) If a number is divisible by 4, it must be divisible by 8. False
Example: 28 is divisible by 4 but not divisible by 8.

(ii) If a number is divisible by 8, it must be divisible by 4. True
Example: 32 is divisible by both 8 and 4.

(iii) If a number divides the sum of two numbers exactly, it must exactly divide the numbers separately. False
Example: 91 (51 + 40) is exactly divisible by 13. However, 13 does not exactly divide 51 and 40.

(iv) If a number is divisible by both 9 and 10, it must be divisible by 90. True
Example: 900 is both divisible by 9 and 10. It is also divisible by 90.

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