Question 1.

Which of the following numbers are divisible by 5 or by 10:

(i) 3725

(ii) 48970

(iii) 56823

(iv) 760035

(v) 7893217

(vi) 4500010

Solution:

(i) 3725: divisible by 5 as last digit is 5.

(ii) 48970: divisible by 5 and 10 both as last digit is 0.

(iii) 56823: not divisible by 5 and neither by 10 as last digit is 3.

(iv) 760035: divisible by 5 as last digit is 5.

(v) 7893217: not divisible by 5 and neither 10 as last digit is 7.

(vi) 4500010: divisible by both 5 and 10 as last digit is 0.

Question 2.

Which of the following numbers are divisible by 2, 4 or 8:

(i) 54014

(ii) 723840

(iii) 6531088

(iv) 75689604

(v) 786235

(vi) 5321048

Solution:

(i) 54014

The last digit is 4, hence it is divisible by 2 but not by 4 and 8.

(ii) 723840

This number is divisible by 8, hence it should get divided by all its factors i.e. 2 and 4 (using property 1).

So, 723840 is divisible by 2, 4 and 8.

(iii) 6531088

This number is divided by 8.

So, by using property I, it should also get divided by all its factorise 2 and 4.

Hence, 6531088 is divisible by 2, 4 and 8.

(iv) 75689604

This number is divisible by 4 and not by 8. By using property 1, if it is divisible by 4, then it should also get divisible by its factors also i.e. 2.

(v) 786235

Since, the last digit of the number is 5, which is even.

Hence, It is not divisible by 2, 4 and 8.

(vi) 5321048

This number is divisible by 8.

So, by using property 1, if it is divisible by all its factors i.e., 2 and 4.

Question 3.

Which of the following numbers are divisible by 3 or 9:

(i) 7341

(ii) 59031

(iii) 12345678

(iv) 560319

(v) 720634

(vi) 3721509

Solution:

A number is divisible by 3 if the sum of its digit is divisible by 3 or 9.

(i) 7341 = 7 + 3 + 4 + 1 = 15: divisible by 3.

(ii) 59031 = 5 + 9 + 0 + 3 + 1 = 18: divisible by 3, 9.

(iii) 12345678 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 = 36: divisible by 3, 9.

(iv) 560319 = 5 + 6 + 0 + 3 + 1 + 9 = 24: divisible by 3.

(v) 720634 = 7 + 2 + 0 + 6 + 3 + 4 = 22: not divisible by 3, 9.

(vi) 3721509 = 3 + 7 + 2 + 1 + 5 + 0 + 9 = 27: divisible by 3, 9.

Question 4.

Examine the following numbers for divisibility by 11:

(i) 10428

(ii) 70169803

(iii) 7136985

Solution:

(i) 10428 = 1 + 4 + 8 = 13 and 0 + 2 = 2

Their difference = 13 – 2 = 11, divisible by 11

(ii) 70169803 = 7 + 1 + 9 + 0 = 17 and 0 + 6 + 8 + 3 = 17

Their difference = 17 – 17 = 0, divisible by 11

(iii) 7136985 = 7 + 3 + 9 + 5 = 24 and 1 + 6 + 8 = 15

Their difference = 24 – 15 = 9 not divisible by 11

Question 5.

Examine the following numbers for divisibility by 6:

(i) 93573

(ii) 217944

(iii) 5034126

(iv) 901352

(v) 639210

(vi) 1790184

Solution:

A number is divisible by 6 if it is divisible by 2 as well as by 3.

(i) 93573: not divisible by 6 because, it is not divisible by 2.

(ii) 217944: divisible by 6, as it is divisible by both 2 and 3.

The last digit of 217944 is 4, which is divisible by 2.

∴ The number is divisible by 2.

Now, the sum of the digits 217944 = 2 + 1 + 7 + 9 + 4 + 4 = 27

27 is divisible by 3.

Hence, given number is divisible by 2 x 3 = 6

(iii) 5034126: divisible by 6, as it is divisible by both 2 and 3.

The last digit of 5034126 is 6, which is divisible by 2.

Now, sum of 5034126 = 5 + 0 + 3 + 4 + 1 + 2 + 6 = 21

21 is divisible by 3.

Hence, given number 5034126 is divisible by 6.

(iv) 901352

The last digit 901352 is 2, which is divisible by 2

∴ The given number is divisible by 2

Now, the sum of the digits of 901352 is

9 + 0 + 1 + 3 + 5 + 2 = 20

20 is not divisible by 3

The given number 901352 is not divisible by 6

So we can say 93573 is not divisible by 6

(v) 639210

The last digit of 639120 is 0, which is divisible by 2,

∴ The given number is divisible by 2

Now, the sum of the digits of 639120 is

6 + 3 + 9 + 1 + 2 + 0 = 21

21 is divisible by 3

The given number 639120 is divisible by 6

(vi) 1790184

The last digit of 1790184 is 4, which is divisible by 2

∴ The given number is divisible by 2

Now, the sum of the digits of 1790184 is

1 + 7 + 9 + 0 + 1 + 8 + 4 = 30

30 is divisible by 3.

∴ The given number 1790184 is divisible by 6

Question 6.

In each of the following replace '*' by a digit so that the number formed is divisible by 9:

(i) 4710 * 82

(ii) 70 * 356722

Solution:

(i) 4710 * 82

The given number = 4710 * 82 Sum of its given digits = 4 + 7 + 1+ 0 + 8 + 2 = 22

The number next to 22 which is divisible by 9 is 27.

∴ Required smallest number = 27 – 22 = 5

(ii) 70 * 356722

The given number = 70 * 356722 Sum of its given digits

= 7 + 0 + 3 + 5 + 6 + 7 + 2 + 2 = 32

The number next to 32 which is divisible by 9 is 36.

∴ Required smallest number = 36 – 32 = 4

Question 7.

In each of the following replace '*' by (i) the smallest digit (ii) the greatest digit so that the number formed is divisible by 3:

(a) 4 * 672

(b) 4756 * 2

Solution:

(a) 4 * 672

(i) Smallest digit

Sum of the given digits = 4 + 6 + 7 + 2=19

∵ 19 is not divisible by 3

∴ Smallest digit (non–zero) is = 2

(ii) Greatest digit

The greatest digit is 8

i. e. 19 + 8 = 27 which is divisible by 3

(b) 4756 * 2

(i) Smallest digit

Sum of the given digits = 4 + 7 + 5 + 6 = 24

∵ 24 is divisible by 3

∴ Smallest digit is 0.

(ii) Greatest digit

The greatest digit is 9

i. e. 24 + 9 = 33 which is divisible by 3.

Question 8.

In each of the following replace '*' by a digit so that the number formed is divisible by 11:

(i) 8 * 9484

(ii) 9 * 53762

Solution:

(i) 8 * 9484

Sun of the given digits (at odd places) from the right

= 4 + 4 + required digit

= 8 + required digit

Sum of the given digits (at even places) from the right = 8 + 9 + 8 = 25

Difference of sums = 25 – (8 + required digit) = 17 – required digit

11 is the number smaller than 17, who gets divided by 11

∴ For the above difference to be divisible by 11

required digit = 6

Hence the required number is 869784

(ii) 9 * 53762

Sum of the given digits (at odd places) from the right

= 2 + 7 + 5 + 9 = 23

Sum of the given digits (at even places) from the right

= 6 + 3 + required number = 9

Difference of sums = 23 – (9 + required number) = 14– required number

For the above difference to be divisible by 11 required digit = 3

= 14 – 3 = 11

11 is divisible by 11

Hence, the required number is 9353762

Question 9.

In each of the following replace '*' by (i) the smallest digit 00 the greatest digit so that the number formed is divisible by 6:

(a) 2 * 4706

(b) 5825 * 34

Solution:

(a) 2 * 4706

If the number is divisible by 6 then the number should also get divisible by 2 and 3.

⇒ The last digit of2 * 4706 is 6, so it is divisible by 2.

⇒ The sum of 2 * 4706

= 2 + 4 + 7 + 0 + 6=19

(i) Smallest required number to be added in 19 is 2.

As 19 + 2 = 21 (i.e. 21 is divisible by 3)

(ii) Greatest required number to be added in 19 is 8

As 19 + 8 = 27 (i.e. 27 is divisible by 3)

(b) 5825 * 34

If the number is divisible by 6, then it should get divisible by 2 and 3.

⇒ The last number is 4, so it is divisible by 2

⇒ The sum of 5825 * 34

= 5 + 8 + 2 + 5 + 3 + 4 = 27

(i) The smallest number to be added in 27 is 0 27 + 0 = 27 (27 is divided by 3)

(ii) Greatest number to be added in 27 is 9

i.e. 27 + 9 = 36

36 is divided by 3

Question 10.

Which of the following numbers are prime:

(i) 101

(ii) 251

(iii) 323

(iv) 397

Solution:

(i) 101

We have, $101 = 1 \times 101$

$\Rightarrow$ 101 has exactly two factors 1 and 101 itself.

$\therefore$ 101 is a prime number.

(ii) 251

We have, $251 = 1 \times 251$

$\Rightarrow$ 251 has exactly two factors 1 and 251 itself.

$\therefore$ 251 is a prime number.

(iii) 323

We have, $323 = 1 \times 323 = 17 \times 19$

$\therefore$ Factors of 323 are 1, 17, 19, 323

$\Rightarrow$ 323 has more than two factors.

$\therefore$ 323 is not a prime number.

(iv) 397

We have, $397 = 1 \times 397$

$\Rightarrow$ 397 has exactly two factors 1 and 397 itself.

397 is a prime number.

Question 11.

Determine if 372645 is divisible by 45.

Solution:

To determine if 25110 is divisible by 45, we test it for divisible by 5 and 9 both. Divisibility of 372645 by 5

∴ Number in the unit's place of 372645 = 5

∴ 372645 is divisible by 5

Divisibility of 372645 by 9

Sum of the digits of the number 372645 = 3 + 7 + 2 + 6 + 4 + 5 = 27

∵ 27 is divisible by 9

∴ 372645 is divisible by 9

As 372645 is divisible by 5 and 9 both and 5 and 9 are co–prime numbers, so 372645 is divisible by 5 × 9 = 45

Question 12.
A number is divisible by 12. By what other numbers will that number be divisible?
Solution:
The number divisible by 12, should also get divisible by all its factors.
⇒ So, the numbers by which the given number is divisible are : 1, 2, 3, 4, 6.

Question 13.
A number is divisible by both 3 and 8. By which other numbers will that number be always divisible?
Solution:
Let a natural number, say n, be divisible by both 3 and 8.
As 3 and 8 are co–prime numbers using property n is divisible by 3 x 8 i.e. 24.
Thus, the given number is always divisible by 24.
⇒ So the given number should get divided by all the factors of 24.
Hence, the other number by which the given numbers is always divisible are :
1, 2, 4, 6, 12, 24

Question 14.

State whether the following statements are true (T) or false (F):

(i) If a number is divisible by 4, it must be divisible by 8.

(ii) If a number is divisible by 3, it must be divisible by 9.

(iii) If a number is divisible by 9, it must be divisible by 3.

(iv) If a number is divisible by 9 and 10 both, it must be divisible by 90.

(v) If a number divides two numbers separately, then it must divide their sum.

(vi) If a number divides the sum of two numbers, then it must divide the two numbers separately. .

(vii) If a number is divisible by 3 and 8 both, it must be divisible by 12.

(i) False

(ii) False

(iii) True

(iv) True

(v) True

(vi) False

(vii) True

(vii) False