Exercise 5 D'

Q2

1) 1x5 divisible by 3?

Ans) 1+x+5 multiple of 3

6+x = 0, 3, 6 or 9

⇒ 6+x = 0

x = 0-6 = -6

⇒ 6+x = 3

x = 3-6 = -3

⇒ 6+x = 6

x = 6-6 = 0

⇒ 6+x = 9

x = 9-6 = 3

∴ x = -6, -3, 0, 3, 6, 9

Since x is a digit.

x = 0, 3, 6, 9

2) 31x5 divisible by 3?

3+1+x+5 is a multiple of 3

9+x = 0, 3, 6 or 9

⇒ 9+x = 0

x = 0-9 = -9

⇒ 9+x = 3

x = 3-9 = -6

⇒ 9+x = 6

x = 6-9 = -3

⇒ 9+x = 9

x = 9-9 = 0

∴ x = -9, -6, -3, 0, 3, 6, 9

Since x is a digit

x = 0, 3, 6 or 9

3) 28x6 is multiple of 3

2+8+x+6 is a multiple of 3

= 16+x = 0, 3, 6, 9, 12, 15, 18, 21

⇒ 16+x = 0

x = 0-16 = (-16)

⇒ 16+x = 3

x = 3-16 = (-13)

⇒ 16+x = 6

x = 6-16 = (-10)

⇒ 16+x = 9

x = 9-16 = (-7)

⇒ 16+x = 12

x = 12-16 = (-4)

⇒ 16+x = 15

x = 15-16 = (-1)

⇒ 16+x = 18

x = 18-16 = 2

⇒ 16+x = 21

x = 21-16 = 5

∴ x = -13, -10, -7, -4

Since x is a digit

∴ x = 2, 6, 9 or 12

4) 24x divisible by 6

Ans) 24x is divisible by 6, if it is divisible by 2 and 3 both

24x is divisible by 3

2+4+x is a multiple of 3

6+x = 0, 3, 6, 9, 12

⇒ 6+x = 0

x = -6

⇒ 6+x = 3

x = -3

$\Rightarrow 6+x=6$

$x=6-6=0$

$\Rightarrow 6+x=9$

$x=9-6=3$

$\Rightarrow 6+x=12$

$x=12-6=6$

$\therefore x=-6,-3,0,3,6 \quad \ldots\ldots\ldots (i)$

Since x is digit

$\therefore x=0,3,6,9,12$

(ii) $24x$ is divisible by 2

$2+4+x$ is a multiple of 2

$6+x=0,2,4,6,8,10$

$6+x=0$

$x=-6$

$6+x=2$

$x=-4$

$6+x=4$

$x=-2$

$6+x=6$

$x=6-6=0$

$6+x=8$

$x=8-6=2$

$6+x=10$

$x=10-6=4$

$\therefore x=-6,-4,-2,0,2,4$

Since x is a digit

$\therefore x=0,2,4,6,8$

$\therefore x=0,6$ which is divisible by 6.

5. 3x26 a multiple of 6

Ans⇒ 3x26 is a multiple of 2 and 3 both.

⇒ 3x26 is a multiple of 2 as it has even number 6 at its unit place.

⇒ 3x26 is a multiple of 3

⇒ 3+x+2+6 is a multiple of 3

⇒ 11+x = 0, 3, 6, 9, 12, 15, 18, 21

⇒ 11+x = 0

x = -11

⇒ 11+x = 3

x = -8

⇒ 11+x = 6

x = 6-5

⇒ 11+x = 9

x = -2

⇒ 11+x = 12

x = 1

⇒ 11+x = 15

x = 4

⇒ 11+x = 18

x = 7

⇒ 11+x = 21

x = 10

∴ x = -11, -8, -5, -2, 1, 4, 7, 10

Since x is a digit

∴ x = 1, 4 or 7

6) 42x8 is divisible by 4

Ans) Then the number x8 must be divisible by 4

x8 = 10x + 8

x8 = 8, 18, 28, 38, 48, 58, 68, 78, 88, 98

x8 only 8, 28, 48, 68, 88 are divisible by 4.

So the value of x are 0, 2, 4, 6, 8

7) 9142x is a multiple of 4.

Ans) Then the number 2x is must be a multiple of 4

2x = multiples of 4

2x = 20, 24, 28

∴ x = 0, 4 or 8

8) 7x34 divisible by 9.

Ans) 7+x+3+4 is a multiple of 9

14+x = 0, 9, 18, 27

14+x = 0

x = -14

14+x = 9

x = -5

14+x = 18

x = 4

14+x = 27

x = 13

∴ x = -14, -5, 4, 13

Since x is a digit

∴ x = 4

9) 5x555 a multiple of 9 ?

Ans) 5+x+5+5+5 is a multiple of 9.

20+x = 0, 9, 18, 27, 36

20+x = 0

x = -20

20+x = 9

x = 9-20 = (-11)

$20+x=18$

$x=-2$

$20+x=27$

$x=7$

$20+x=36$

$x=16$

$\therefore x=-20,-11,-2,7,16$

Since x is a digit

$\therefore x=7$ or 16

10) $3x2$ divisible by 11

Sum of the digit in even place $=x$

Sum of the digit in odd place $=3+2=5$

Difference in the sum of digits in even place and sum of digits in odd place

$=x-5$

$3x2$ is a multiple of 11

$\Rightarrow x-5$ must be multiple of 11

$\Rightarrow x-5=0,11,22$

$\Rightarrow x-5=0$

$x=5$

$\Rightarrow x-5=11$

$x=16$

$\Rightarrow x-5=22$

$x=17$

$\therefore x=5,16,17$

$\therefore x=5$

11) $5x2$ a multiple of 11

Sum of digit in even place $=x$

Sum of digit in odd place $=5+2=7$

Difference in the sum of the digits in even place and sum of digit in odd place

$=x-7$

5x2 is a multiple of 11

$x-7$ is a multiple of 11

$x-7 = 0, 11, 22, 33, 44, \ldots$

$x-7 = 0$

$x = 7$

$x-7 = 11$

$x = 18$

$x-7 = 22$

$x = 19$

$x-7 = 33$

$x = 40$

$x-7 = 44$

$x = 51$

$\therefore x = 7, 18, 19, 40, 51 \ldots$

$\therefore x = 7$

$-x-x-x-x-$