Ex-5(D)

1) $1+x+5$ is a multiple of 3
$6+x$ is a multiple of 3
$6+x = 3, 6, 9, 12, 18$

$6+x=3$	$6+x=6$	$6+x=9$	$6+x=12$	$6+x=18$
$x=3-6$	$x=6-6$	$x=9-6$	$x=12-6$	$x=18-6$
$=(-3)$ ✗	$=(0)$ ✓	$=(3)$ ✓	$=(6)$ ✓	$=(12)$ ✗

Since x is a digit so $x = 0$ or 3 or 6 or 9

2) $3+1+x+5$ is a multiple of 3
$9+x$ is a multiple of 3
$9+x = 3, 6, 9, 12, 15, 18, 21, 24$

$9+x=3$	$9+x=6$	$9+x=9$	$9+x=12$	$9+x=15$
$x=3-9$	$x=6-9$	$x=0$	$x=12-9$	$x=15-9$
$=(-6)$ ✗	$=(-3)$ ✗	✓	$=(3)$ ✓	$=(6)$ ✓

$9+x=18$	$9+x=21$
$x=18-9$	$x=21-9$
$=(9)$ ✓	$=(12)$ ✗

Since x is a digit so $x = 0$ or 3 or 6 or 9

3) $28x6$
$2+8+x+6$ is a multiple of 3
$16+x$ is a multiple of 3
$16+x = 3, 6, 9, 12, 15, 18, 21, 24, 27$

$x=3-16$	$16+x=6$	$16+x=9$	$16+x=12$	$16+x=15$	$16+x=18$
$=(-13)$ ✗	$x=6-16$	$x=9-16$	$x=12-16$	$x=(-1)$ ✗	$x=18-16$
	$=(-10)$ ✗	$=(-5)$ ✗	$=(-4)$ ✗		$=(2)$ ✓

$16+x=21$ | $16+x=24$ | $16+x=27$

$x=21-16$ | $x=8$ | $x=11$

$=5$

Since x is a digit, so $x = 2$ or 5 or 8

4) $24x6$

$24x6$ is divisible by 2 as it has even number 6 at its unit place

$24x6$

$24+x+6$ is a multiple of 3

$12+x$ is a multiple of 3

$12+x = 3, 6, 9, 12, 15, 18, 21, 27$

$x = -11, -6, -1, 0, 3, 6, 9$

Since, x is a digit, x can have values 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

$x = 0$ or 6

Common, Dada

5) $3x26$

$3x26$ is divisible by 2 as it has even number 6 at its unit place

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

$11+x = 3, 6, 9, 12, 15, 18, 21, 27$

$x = -8, -5, -2, 1, 4, 7, 10$

x can have values → 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

So common → 1 or 4 or 7

6) 42x8

42x8 is divisible by 4

x8 is divisible by 4

10x+8 is a multiple of 4

10x+8 = 4, ~~12~~, ~~44~~, ~~64~~, ~~84~~ 4, 8, 12, 16, ~~20~~, ~~24~~

~~10x = -4~~, ~~0~~, 4, 8,

10x+8 = 8, 18, 28, 38, 48, 58, 68, 78, 88, 98

x = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Out of these values, 8, 28, 48, 68 and 88 are divisible by 4

No possible values of x are 0 or 2 or 4 or 6 or 8

7) 9142x

9142x is divisible by

2+x is a multiple of 4

2+x = 0, 4, 8, 16, 20, 24, 28,

x = 0, 2, 6, 14, 18, 22, 26

Out of these values 0, 4, 8 are divisible by 4

No possible values of x are 0, 4 or 8

8) 7x34

7x34 is divisible by 9

7+x+3+4 is divisible by 9

14+x is a multiple of 9

14+x = 9, 18, 27, 36, 45

8

$14+x=9$	$14+x=18$	$14+x=27$
$x=9-14$	$x=4$ ✓	$x=27-14$
$=-5$ ✗		$=13$ ✗

∴ No x is a digit so $x=4$

9) $5x555$

$5x555$ is divisible by 9

$5+x+5+5+5$ is divisible by 9

$20+x$ is a multiple of 9

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

$20+x=9$	$20+x=18$	$20+x=27$	$20+x=36$
$x=9-20$	$x=-2$ ✗	$x=7$ ✓	$=16$ ✗
$=-11$ ✗			

No $x=7$

10) $3x2$

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

In even place $=x$

Difference $=5-x$

$3x2$ is a multiple of 11

$5-x$ is a multiple of 11

$5-x=0, 11, 22, 33$

$x=5, 16, 27\ldots\ldots$

$5-x=4$ Since y is a digit. x can take values $1, 2, 3\ldots$ 9

So the possible value $=5$

10) 5x2

Sum of the digit in odd places = 5+2 = 7

Sum of the digit in even places = x

So, Difference = x - 7

5x2 is divisible by 11

x - 7 is a multiple of 11

x - 7 = 0, 11, 22, 33 .....

x = 7, 18, 29, 40 ....

Since, x is a digit. So we can take values 1, 2, 3, ... 9

So value of x = 7