

Exercise 5.2

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Q.1 Given that the number $\overline{35a64}$ is divisible by 3, where a is a digit, what are the possible values of a ?

Solution: If a number is divisible by 3, then sum of digits must be a multiple of 3.

$$\therefore 3 + 5 + a + 6 + 4 = 18 + a$$

so a can take values 0, 3, 6, 9

as $18 + 0 = 18$, $18 + 3 = 21$, $18 + 6 = 24$, $18 + 9 = 27$ are divisible by 3.

Q.2 If x is a digit such that the number $18x71$ is divisible by 3, find possible values of x .

Solution: $\therefore 1 + 8 + x + 7 + 1 = 17 + x$

$$\therefore 17 + 1 = 18, 17 + 4 = 21, 17 + 7 = 24$$

so x can take values 1, 4 and 7.

Q.3 If x is a digit of the number $\overline{66784x}$ such that it is divisible by 9, find possible values of x .

Solution: As we know that if a number is divisible by 9, then sum of digits must be a multiple of 9

$$\therefore 6+6+7+8+4+x = 31+x$$

$$\therefore 31+5=36 \text{ is divisible by 9}$$

$$\text{hence } x=5$$

Q.4 Given that the number $\overline{67y19}$ is divisible by 9, where y is a digit, what are the possible values of y .

Solution: $\therefore 6+7+y+1+9 = 23+y$

$$\therefore 23+y = 27$$

$$\Rightarrow y=4$$

Q.5 If $\overline{3x2}$ is a multiple of 11, where x is a digit, what is the value of x .

Solution: As we know that a number is divisible by 11 if and only if difference between the sum of odd and even place digits is a multiple of 11 or 0.

i.e

$$x - (3+2) = 0, 11, 22, \dots$$

$$x - 5 = 0$$

$$x = 5$$

Q.6 If $\overline{98215x2}$ is a number with x as its tens digit such that it is divisible by 4. Find all possible values of x . (6)

Solution: A number is divisible by 4 only when the number formed by its digits in unit place and ten's place is divisible by 4

i.e. $x2$ is divisible by 4.

hence $x2$ can take values: 2, 12, 22, 32, 42, 52, 62, 72, 82 and 92.

out of which, 12, 32, 52, 72, 92 are divisible by 4.

$\therefore x$ takes values = 1, 3, 5, 7, 9

Q.7 If x denotes the digit at hundreds place of the number $\overline{67x19}$ such that the number is divisible by 11. Find all possible values of x .

Solution: $(6+x+9) - (7+1) = 0, 11, 22, \dots$

$$\Rightarrow 15+x-8 = 0, 11, 22, \dots$$

$$\Rightarrow 7+x=11$$

$$x=11-7=4$$

Q.8 Find The remainder when 981547 is divided by 5. Do this without doing actual division.

Solution: we know that If a number is divided by 5, then remainder is obtained by dividing just the unit place by 5.

i.e $7 \div 5$ gives 2 as remainder.

$\therefore$ Remainder will be 2 when 981547 is divided by 5.

Q.9 Find the remainder when 51439786 is divided by 3. Do this without performing actual division.

Solution: Here Sum of digits
 $= 5 + 1 + 4 + 3 + 9 + 7 + 8 + 6 = 43$

i.e $43 \div 3$ gives 1 as remainder

therefore when 51439786 is divided by 3, remainder is 1.

Q.10 Find the remainder, without performing actual division when 798 is divided by 11.

Solution: we know that if a number is divided by 11, then remainder is difference between sum of even and odd digit places.

$$\begin{aligned} \text{i.e remainder} &= 7 + 8 - 9 \\ &= 6. \end{aligned}$$

Q.11 without performing actual division, find the remainder when 928174653 is divided by 11

Solution: Sum of digits at even places = $5 + 4 + 1 + 2$
 $= 12$

Sum of digits at odd places = $3 + 6 + 7 + 8 + 9$
 $= 33$

Difference = $33 - 12$
 $= 21$

$\therefore 21 \div 11$ gives 10 as remainder.

$\therefore$ Remainder will be 10 if 928174653 is divided by 11.

Q.12 Given an example of a number which is divisible by

(i) 2 but not by 4

(ii) 3 but not by 6

(iii) 4 but not by 8

(iv) both 4 and 8 but not by 32

Solution

(i) 6 is divisible by 2 but not by 4.

(ii) 9 divisible by 3 but not by 6.

(iii) 12 is divisible by 4 but not by 8

(iv) 48 is divisible by 4 and 8 but not div. by 32.

Q13 which of the following statements are true?

- (i) If a ~~former~~ number is divisible by 3, it must be divisible by 9.
- (ii) If a number is divisible by 9, it must be divided by 3.
- (iii) If a number is divisible by 4, it must be divisible by 8.
- (iv) If a number is divisible by 8, it must be divisible by 4.
- (v) A number is divisible by 18, if it is divisible by both 3 and 6.
- (vi) If a number is divisible by both 9 and 10, it must be divisible by 90.
- (vii) If a number exactly divides the sum of two numbers, it must exactly divide the numbers separately.
- (viii) If a number divides three numbers exactly, it must divide the sum exactly.
- (ix) If two numbers are coprime, at least one of them must be a prime number.
- (x) The sum of two consecutive odd numbers is always divisible by 4.

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Sol! (i) False

(ii) True

(iii) False

(iv) True

(v) False

(vi) True

(vii) False

(viii) True

(ix) False

(x) True.

Exercise 5.3