Chapter 5: Playing with Numbers
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Exercise 5A

Question 1:
Solution:
Given $10x + 3 = 7[x + 3] \Rightarrow 3x = 18 \Rightarrow x = 6$.
So the number is 63.

Question 2:
Solution:
If the number at the tens place is x, the number at the units place is 2x.
Given $10x + 2x = x + 2x + 18 \Rightarrow x = 2$. So the number is 24.

Question 3:
Solution:
Given $(10x + y) - 4(x + y) = 3$
And $(10x + y) + 18 = 10y + x$
We thus get $6x - 3y = 3 \Rightarrow 2x – y = 1$
Solving for x, we get $x = 3$ and $y = 5$.
Therefore the number = 35.

Question 4:
Solution:
Let the number be $10x+y$
Given $x + y = 15$ and $10y + x – 10x – y = 9$
That is $9y - 9x = 9 \Rightarrow x – y = -1$
Thus $2x = 14 \Rightarrow x = 7$ and hence $y = 8$
Therefore the number is $10x + y = 78$.

Question 5:
Solution:
Given $(10X+Y) - (10Y+X) = 63 \Rightarrow 10X + Y - 10Y - X = 63$
Hence, $9X - 9Y = 63 \Rightarrow 9(X - Y) = 63$
$X - Y = 7$
The difference between the digits of the number is hence 7.

Question 6:
Solution:
Let the number be xyz.
Given $x + y + z = 16$.
Also, $y = 3z$ and $x = 4z$.
$4z + 3z + z = 16 \Rightarrow z = 2$. So, $y = 6$ and $x = 8$.

The number is hence 862.

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Exercise 5B

Question 1:
Solution:
(i) 94 => last digit is even so it is divisible by 2.
(ii) 570 => last digit is even so it is divisible by 2.
(iii) 285 => last digit is odd so it is not divisible by 2.
(iv) 2398 => last digit is even so it is divisible by 2.
(v) 79532 => last digit is even so it is divisible by 2.
(vi) 13576 => last digit is even so it is divisible by 2.
(vii) 46821 => last digit is odd so it is not divisible by 2.
(viii) 84663 => last digit is odd so it is not divisible by 2.
(ix) 66669 => last digit is odd so it is not divisible by 2.

Question 2:
Solution:
(i) 95 => last digit is 5, so it is divisible by 5.
(ii) 470 => last digit is 0, so it is divisible by 5.
(iii) 1056 => last digit is 6, so it is not divisible by 5.
(iv) 2735 => last digit is 5, so it is divisible by 5.
(v) 55053 => last digit is 3, so it is not divisible by 5.
(vi) 35790 => last digit is 0, so it is divisible by 5.
(vii) 98765 => last digit is 5, so it is divisible by 5.
(viii) 42658 => last digit is 8, so it is not divisible by 5.
(ix) 77990 => last digit is 0, so it is divisible by 5.

Question 3:
Solution:
(i) 205 => last digit is not zero so it is not divisible by 10.
(ii) 90 => last digit is zero so it is divisible by 10.
(iii) 1174 => last digit is not zero so it is not divisible by 10.
(iv) 57930 => last digit is zero so it is divisible by 10.
(v) 60005 => last digit is not zero so it is not divisible by 10.

Question 4:
Solution:
(i) 83 => Sum of the digits = 11 which is not divisible by 3.
(ii) 378 => Sum of the digits = 18 which is divisible by 3.
(iii) 474 => Sum of the digits = 15 which is divisible by 3.

(iv) 1693 => Sum of the digits = 19 which is not divisible by 3.
(v) 20345 => Sum of the digits = 14 which is not divisible by 3.
(vi) 67035 => Sum of the digits = 21 which is divisible by 3.
(vii) 591282 => Sum of the digits = 27 which is divisible by 3.
(viii) 903164 => Sum of the digits = 23 which is not divisible by 3.
(ix) 100002 => Sum of the digits = 3 which is divisible by 3.

Question 5:
Solution:
(i) 327 => Sum of digits = 12 which is not divisible by 9.
(ii) 7524 => Sum of digits = 18 which is divisible by 9.
(iii) 32022 => Sum of digits = 9 which is divisible by 9.
(iv) 64302 => Sum of digits = 15 which is not divisible by 9.
(v) 89361 => Sum of digits = 27 which is divisible by 9.
(vi) 14799 => Sum of digits = 30 which is not divisible by 9.
(vii) 66888 => Sum of digits = 36 which is divisible by 9.
(viii) 30006 => Sum of digits = 9 which is divisible by 9.
(ix) 33333 => Sum of digits = 15 which is not divisible by 9.

Question 6:
Solution:
(i) 134 => 34 is not divisible by 4.
(ii) 618 => 18 is not divisible by 4.
(iii) 3928 => 28 is divisible by 4.
(iv) 50176 => 76 is divisible by 4.
(v) 39392 => 92 is divisible by 4.
(vi) 56794 => 94 is not divisible by 4.
(vii) 86102 => 02 is not divisible by 4.
(viii) 66666 => 66 is not divisible by 4.
(ix) 99918 => 18 is not divisible by 4.
(x) 77736 => 36 is divisible by 4.

Question 7:
Solution:
(i) 6132 => 132 is not divisible by 8.
(ii) 7304 => 304 is divisible by 8.
(iii) 59312 => 312 is divisible by 8.
(iv) 66664 => 664 is divisible by 8.
(v) 44444 => 444 is not divisible by 8.
(vi) 154360 => 360 is divisible by 8.
(vii) 998818 => 818 is not divisible by 8.
(viii) 265472 => 472 is divisible by 8.
(ix) 7350162 => 162 is not divisible by 8.

Question 8:

Solution:

(i) 22222 => difference between sum of odd and even places = (6-4) = 2, hence this is not divisible by 11.

(ii) 444444 => difference between sum of odd and even places = (12 – 12) = 0, hence this is divisible by 11.

(iii) 379654 => difference between sum of odd and even places = (17 - 17) = 0, hence this is divisible by 11.

(iv) 1057982 => difference between sum of odd and even places = (17 - 15) = 2, hence this is not divisible by 11.

(v) 6543207 => difference between sum of odd and even places = (19 - 8) = 11, hence this is divisible by 11.

(vi) 818532 => difference between sum of odd and even places = (19 - 8) = 11, hence this is divisible by 11.

(vii) 900163 => difference between sum of odd and even places = (15 - 4) = 11, hence this is divisible by 11.

(viii) 7531622 => difference between sum of odd and even places = (18 – 8) = 10, hence this is not divisible by 11.

Question 9:

Solution:

(i) 693 => 69 – 6 = 63 which is divisible by 7.

(ii) 7896 => 789 – 12 = 777 which is divisible by 7.

(iii) 3467 => 346 – 14 = 332 which is not divisible by 7.

(iv) 12873 => 1287 – 6 = 1281 which is divisible by 7.

(v) 65436 => 6543 - 12 = 6531 which is divisible by 7.

(vi) 54636 => 5463 – 12 = 5451 which is not divisible by 7.

(vii) 98175 => 9817 – 10 = 9807 which is divisible by 7.

(viii) 88777 => 8877 – 14 = 8863 which is not divisible by 7.

Question 10:

Solution:

For this number 7x3 to be divisible by 3, the possible values of x are 2, 5, 8 and the numbers are hence 723, 753, and 783.

Question 11:

Solution:

The sum of digits of 53y1 is 9 + y so for this to be divisible by 3, the value of y = 0, 3, 6 and 9. The possible numbers are thus 5301, 5331, 5361, and 5391.

Question 12:

Solution:

The sum of digits of x806 equals 14 + x, so the value of x must be 4. So the number will be 4806.

Question 13:
Solution:
The sum of digits of 471z8 is 20 + z so the value of z must be 7. The number is 47178.

Question 14:
Solution:
Examples of five numbers that are divisible by 3 but not by 9 are 6, 12, 15, 21, and 24.

Question 15:
Solution:
Examples of five numbers that are divisible by 4 but not by 8 are 12, 20, 28, 36, and 44.

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Exercise 5C

Question 1:
Solution:
It is clear from the given problem that A = 6, B = 4 and C = 1.

Question 2:
Solution:
From the above problem, A = 7, B = 7 and C = 4.

Question 3:
Solution:
It is clear from the above problem that 3A = BA => B = 1 and A = 5.

Question 4:
Solution:
It is clear that A = 2 and B = 5.

Question 5:
Solution:
It is clear that A = 6 and hence B = 4 and C = 5.

Question 6:
Solution:
Since the product of B and 3 equals B itself, so B = 0 and hence A = 5 and C = 1.

Question 7:
Solution:
By trial and error method, we arrive at the values of A, B and C to be equal to 1, 3 and 0.

Question 8:
Solution:
From the above division, it is clear that A = 7, B = 6 and hence C = 6.

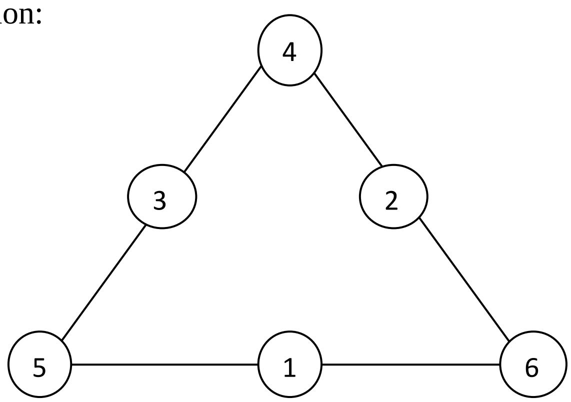
Question 9:
Solution:
The two numbers whose product is a 1-digit number and the sum is a 2-digit number is 9 and 1 by trial and error method.

Question 10:
Solution:
By trial and error, we obtain the values of the three numbers to be equal to 1, 2 and 3 as the sum of these numbers = 6 and the product also equals 6.

Question 11:
Solution:
From the given numbers, the magic square is formed in such a way that the sum of its digits is 15 vertically, horizontally and diagonally.

6	1	8
7	5	3
2	9	4

Question 12:
Solution: Since the sum of the numbers on the sides should be the same, by trial and error method, we arrive at the solution:



Question 13:
Solution:
Given the series should be of the form a, b, (a + b), (a +2b), (2a + 3b),(3a +5b), (5a +8b),(8a +13b),(13a+21b), and (21a +34b).

Taking a = 8, b =13; we write the 10 Fibonacci numbers as follows:
8, 13, 21, 34, 55, 89, 144, 233, 377, 610.
Let us add the above numbers. We get 1584 which equals the product of 11 and the 7th number = 1584.

Question 14:
Solution:
From the given numbers, the magic square is formed in such a way that the sum of its digits is 30 vertically, horizontally and diagonally.

3	14	13	0
8	5	6	11
4	9	10	7
15	2	1	12

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Exercise 5D
OBJECTIVE QUESTIONS
Tick (√) the correct answer in each of the following:

Question 1:
Solution:
(b) For 5x6 to be divisible by 3, the least value of x = 1 as the sum of the digits will be 12.

Question 2:
Solution:
(a) For 64y8 to be exactly divisible by 3, the least value of y = 0 as the sum of the digits is 18.

Question 3:
Solution:
(c) For 7x8 to be exactly divisible by 9, the least value of x = 3 as the sum of digits will be 18.

Question 4:
Solution:
(d) For 37y4 to be exactly divisible by 9, the least value of y = 4 as the sum of digits will be 18.

Question 5:
Solution:
(a) For 4xy7 to be exactly divisible by 3, the least value of (x + y) = 1 so that the sum of digits = 12.

Question 6:
Solution:
(d) For x7y5 to be exactly divisible by 3, the least value of (x + y) = 3 as sum of digits = 15. 0 is incorrect as the first digit cannot be zero.

Question 7:
Solution:
(c) For x4y5z to be exactly divisible by 9, the least value of $(x + y + z) = 9$ as the sum of digits is 18. 0 is incorrect as the first digit cannot be zero.

Question 8:
Solution:
(b) For 1A2B5 to be exactly divisible by 9, the least value of $(A + B) = 1$ as its sum = 9.

Question 9:
Solution:
(d) For the 4-digit number x27y to be exactly divisible by 9, the least value of $(x + y)$ is 9 so that the sum of its digits is 18.

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TEST PAPER – 5
A.
Question 1:
Solution:
For this number 320x to be divisible by 3, the sum of its digits is $5 + x$, so x can be either 1 or 4 or 7. So the numbers possible are 3201, 3204 and 3207.

Question 2:
Solution:
The sum of the digits of 64y3 is $13 + y$. So, for this to be divisible by 9, y can be 5 only. So the number is 6453.

Question 3:
Solution:
$(x + y) = 6$
$10y + x = 10x + y + 18 \Rightarrow 10y + 6 – y = 10 (6 - y) + y + 18 \Rightarrow 9y + 6 = 78 – 9y \Rightarrow 18y = 72 \Rightarrow y = 4$ and $x = 2$
The original number is hence 24.

Question 4:
Solution:
(i) 524618 – sum of the digits = 26 which is not divisible by 9.
(ii) 7345845 – sum of the digits = 36 which is divisible by 9.
(iii) 8987148 – sum of the digits = 45 which is divisible by 9.
So (ii) and (iii) are divisible by 9.

Question 5:
Solution:
From the subtraction, $A = 1$, so $B = 7$ and $C = 2$.

Question 6:
Solution:
From the above division, $6A = 62 \Rightarrow A = 2$, thus $B = 3$ and hence $C = 9$.

Question 7:
Solution:
The product of B and A is B implies, $A = 1$, thus $B = 2$ and $C = 5$.

B. Mark (√) against the correct answer in each of the following:
Question 8:
Solution:
(b) Since 7x8 is divisible by 3 already as its sum is 15, the value of x can be 0.

Question 9:
Solution:
(c) For 6x5 to be divisible by 9, x must be 7 so that $6 + 5 + 7 = 18$.

Question 10:
Solution:
(c) For x48y to be divisible by 9, the sum of x and y must be 6 so that the sum is $4 + 8 + 6 = 18$.

Question 11:
Solution:
(d) Since the sum of the digits of 486*7 is 25, adding 2 to this sum makes it divisible by 9.