CHAPTER 16

PLAYING WITH NUMBERS

Points to Remember

- Number can be written in general form. Thus a two digit number ab will be written as $ab = 10a + b \Rightarrow 25 = 10 \times 2 + 5$
- The general form of numbers are helpful in solving puzzles or number games.
- Test of Divisibility :
  - If the ones digit of a number is 0, 2, 4, 6 or 8 then it is divisible by 2.
  - If the ones digit of a number is 0 or 5 then it is divisible by 5.
  - If the ones digit of a number is 0 then it is divisible by 10.
  - If the sum of the digit of a number is divisible by 3 then the number is also divisible by 3.
  - If the sum of the digits of a number is divisible by 9 then the number is also divisible by 9.
  - A number will be divisible by 11 if the difference between the sum of the digits at its odd places and that of digits at the even places is divisible by 11.

QUESTIONS

1. Find Q in addition

$$\begin{array}{r} 3\,1\,Q \\ +\,1\,Q\,3 \\ \hline 4\,6\,8 \end{array}$$

2. Find the digits A and B.

$$\begin{array}{r} B\;A \\ \times B\;3 \\ \hline 4\,6\,A \end{array}$$

3. Find the digits A and B.

$$\begin{array}{r} 1\,2\,A \\ +\,6\;A\,B \\ \hline A\,0\,9 \end{array}$$

4. If a number $N \div 5$ Leaves a remainder of 3. What are the possible one's digit of N.

5. If a number $N \div 5$ leaves a remainder of 1. What are the possible ones digit of N.
6. If $312x$ is a multiple of 5. Where x is a digit. What is the least value of x.
7. Find two digit number ab in general form
8. If the division $N \div 2$ leaves a remainder of 1. What might be the highest ones digit of N.
9. If the division $N \div 5$ leaves a remainder 4 and the division $N \div 2$ leaves a remainder 1. What must be the ones digit of N.
10. If the sum of a two digit number and number obtained by reverse the digit is divide by 11. What is the remainder?
11. If the difference of a two digit number (ab) where $a > b$and number obtained by reverse the digit is divided by 9. What is the remainder?
12. If $376x5$ is a multiple of 3, where x is a digit. What is the highest value of x.
13. If $98m341$ is a multiple of 3, where m is a digit. What is the least value of m.
14. If the division $1234x \div 3$ leaves a remainder of 1. What might be the least value of x.
15. If the number 123A4 is divide by 3. It leaves a remainder 1. What is the least value of A.
16. If $23B4$ is a multiple of 3. Where B is a digit. What is the least value of B.
17. $21y5$ is a multiple of 3. Where y is a digit. What is the least value of y.
18. What least number should be added to 98455. So that the number is divisible by 3.
19. What least number should be subtract from 15287 so that the number is divisible by 3.
20. Which number is divisible by 10.
    82513, 42165, 12540, 34255, 16751
21. Which number is divisible by 2.

    35243, 10301, 34567, 12345, 24680
22. Which number is divisible by 3.

    10301, 24680, 12345, 35243, 34567
23. Which number is divisible by 5

    20304, 8009, 15432, 9875, 26257
24. What least number should be added to 16751. So that the number is divisible by 10.
25. What least number should be subtract from 26257. So that the number is divisible by 10.
26. Which number is divisible by both 2 and 3.

    12345, 24680, 20304, 8007, 8642
27. If the three digit number $3x5$ is divisible by 9. What is the value of x.

28. Which number is divisible by both 5 and 10.

    98175, 13260, 12345, 5675, 74384

29. What should be added to 981753 so that the number is divisible by both 5 and 10.

30. Which number is divisible by 9

    152875, 423513, 910542, 634526, 543215

31. Find the smallest four digit number which is divisible by 3.

32. Find the greatest five digit number which is divisible by 5.

33. What is the difference between the smallest three digit number and largest two digit number, divisible by 3.

34. Find smallest four digit number which is divisible by 9.

35. What is the difference between three digit largest and smallest number which is divisible by 3.

36. What is the difference between two digit largest and smallest number which is divisible by 2.

37. If 343M587 is a multiple of 9 where M is a digit. What is the value of M.

38. What number should be added to 152875 to make it exactly divisible by 9.

39. If 21433k is a multiple of 9 where k is a digit. What is the value of k.

40. What should be subtracted from 7528764 to make it exactly divisible by 9.

41. Which number is divisible by 11.

    15287, 16181, 35685, 84215

42. Which number is divisible by both 2 and 11

    1749, 2760, 8118, 2462

43. Which least number should be added to 13076 to make it exactly divisible by 11.

44. Which least number should be substructed from 42384 to make it exactly divisible by11.

45. What is the smallest four digit number exactly division by 11.

46. What is the greatest four digit number exactly divisible by 11.

47. What is the difference between four digit greatest and smallest number, divisible by 11.

48. If 26436T is a multiple of 11. Where T is a digit. What is the value of T.

49. If 39P625 is a multiple of 11. Where P is a digit. What is the value of P.

50. What least number should be subtracted from 35875 to make it exactly divisible by 11.

ANSWERS

1. 5
2. $A = 0, \quad B = 2$
3. $A = 8, \quad B = 1$
4. 3 and 8
5. 1 and 6
6. 0
7. $10a + b$
8. 9
9. 9
10. 0
11. 0
12. 9
13. 2
14. 0
15. 0
16. 0
17. 1
18. 2
19. 2
20. 12540
21. 24680
22. 12345
23. 9875
24. 9
25. 7
26. 20304
27. 1
28. 13260
29. 7
30. 423513
31. 1002
32. 99995
33. 3
34. 1008
35. 897
36. 88
37. 6
38. 8
39. 5
40. 3
41. 16181
42. 8118
43. 3
44. 1
45. 1001
46. 9999
47. 8998
48. 3
49. 4
50. 4

TEST YOUR KNOWLEDGE

1. Find A and B in addition.

$$\begin{array}{r} A \\ +\ A \\ \hline B\,A \end{array}$$

Ten's place *One's place*

2. If $357x$ is a multiple of 2. Where x is a digit. What is the least value of x.
3. What least number should be added to 13723 to make it exactly divisible by 3.
4. Which number is divisible by 3

   653, 423, 983, 674, 908
5. What is the greatest two digit number exactly divisible by 2.
6. What least number should be added to smallest four digit number to make it exactly divisible by 9.
7. What least number should be substracted from smallest four digit number to make it greatest three digit number exactly divisible by 9.
8. What is the greatest four digit number exactly divisible by 5.
9. What least number should be added to smallest four digit number to make it exactly divisible by 11.
10. Which number is divisible by 9.

    2345, 3456, 4567, 5654, 5678

ANSWERS

1. $A = 5, \quad B = 1$
2. 0
3. 2
4. 423
5. 98
6. 8
7. 1
8. 9995
9. 1
10. 3456