

Primary Number System

Question Paper, Set 05

Time: 1 hour 30 minutes

Maximum marks: 50

Name: _____ Class: _____ Date: _____

1. Answer all 20 questions. The marks for each question are shown in brackets.
2. Show your working for the 2, 3 and 5 mark questions.
3. The key sheet and worked solutions are at the end of this paper.

1. Is 0 a natural number? Is it a whole number? [1 mark]
2. Find the remainder when 79 is divided by 2. Is 79 even or odd? [1 mark]
3. Write the first eight multiples of 23. [3 marks]
4. Write all the divisors of 50. [2 marks]
5. Write 132 as a product of two numbers in all possible ways and hence write all its divisors. How many divisors are there? [5 marks]
6. From $b, 15, t, 4, z$, write the constants. [1 mark]
7. Write $12t$ as a product of a number and a letter. [1 mark]
8. Simplify: (i) $y + y + y + y + y + y + y$ (ii) $13y - 8y$ [2 marks]
9. Write n^4 as a product and write how it is read. [2 marks]
10. Find the square of 31. [2 marks]
11. Write 15^3 as a product and find its value. [3 marks]
12. Express 1296 in the exponential form (i) with base 6 (ii) with base 36. [5 marks]
13. Which of the numbers 5280, 637, 914 are divisible by 2? [1 mark]
14. Check whether 40026 is divisible by 3. [2 marks]
15. Find the smallest number greater than 2040 that is divisible by 3. [3 marks]
16. Check whether 92372 is divisible by 4. [2 marks]
17. Is 63005 divisible by 5? Give reason. [1 mark]
18. Check whether 3573 is divisible by 6. [3 marks]
19. Using the divisibility rule for 7, check whether 168, 936 and 518 are divisible by 7. [5 marks]

20. Check whether 81930 is divisible by 2, 3, 4, 5 and 6.

[5 marks]

Key sheet

Q	Answer
1	0 is not a natural number; 0 is a whole number.
2	Remainder 1; 79 is odd
3	23, 46, 69, 92, 115, 138, 161, 184
4	1, 2, 5, 10, 25, 50
5	1, 2, 3, 4, 6, 11, 12, 22, 33, 44, 66, 132 (12 divisors)
6	15, 4
7	$12 \times t$
8	(i) $7y$ (ii) $5y$
9	$n \times n \times n \times n$, read as ' n power 4'
10	961
11	3375
12	(i) 6^4 (ii) 36^2
13	5280, 914
14	Yes, the sum of the digits is 12
15	2043
16	Yes, the last two digits 72 are divisible by 4
17	Yes, the unit digit is 5
18	No, it is not divisible by 2
19	168 and 518 are divisible by 7; 936 is not.
20	Divisible by 2, 3, 5 and 6; not by 4

Solutions

1. Is 0 a natural number? Is it a whole number? [1]

Counting starts from 1, so 0 is not a natural number.

Whole numbers are the natural numbers along with 0, so 0 is a whole number.

Ans: 0 is not a natural number; 0 is a whole number.

2. Find the remainder when 79 is divided by 2. Is 79 even or odd? [1]

$$79 = 2 \times 39 + 1$$

Remainder is 1, so 79 is an odd number.

Ans: Remainder 1; 79 is odd

3. Write the first eight multiples of 23. [3]

Multiples of 23: $23 \times 1, 23 \times 2, 23 \times 3, \dots$

$$23 \times 1 = 23, 23 \times 2 = 46, 23 \times 3 = 69, 23 \times 4 = 92$$

$$23 \times 5 = 115, 23 \times 6 = 138, 23 \times 7 = 161, 23 \times 8 = 184$$

First eight multiples of 23: 23, 46, 69, 92, 115, 138, 161, 184

Ans: 23, 46, 69, 92, 115, 138, 161, 184

4. Write all the divisors of 50. [2]

$$50 = 1 \times 50$$

$$= 2 \times 25$$

$$= 5 \times 10$$

$\therefore$ Factors of 50 are 1, 2, 5, 10, 25, 50

Ans: 1, 2, 5, 10, 25, 50

5. Write 132 as a product of two numbers in all possible ways and hence write all its divisors. How many divisors are there? [5]

$$132 = 1 \times 132$$

$$= 2 \times 66$$

$$= 3 \times 44$$

$$= 4 \times 33$$

$$= 6 \times 22$$

$$= 11 \times 12$$

5, 7, 8, 9, 10 do not divide 132 (they leave a remainder).

$\therefore$ Divisors of 132 are 1, 2, 3, 4, 6, 11, 12, 22, 33, 44, 66, 132

Number of divisors = 12

Ans: 1, 2, 3, 4, 6, 11, 12, 22, 33, 44, 66, 132 (12 divisors)

6. From $b, 15, t, 4, z$, write the constants. [1]

A symbol which has a fixed value is called a constant.

15 and 4 have fixed values; b, t, z are variables.

Ans: 15, 4

7. Write $12t$ as a product of a number and a letter. [1]

As $2 \times a = 2a$, a number times a letter is written without the $\times$ sign.

So $12t = 12 \times t$

Ans: $12 \times t$

8. Simplify: (i) $y + y + y + y + y + y + y$ (ii) $13y - 8y$ [2]

(i) $y + y + y + y + y + y + y$ is y added 7 times.

(i) $y + y + y + y + y + y + y = 7y$

(ii) $13y - 8y = (13 - 8)y = 5y$

Ans: (i) $7y$ (ii) $5y$

9. Write n^4 as a product and write how it is read. [2]

$n^4 = n \times n \times n \times n$

Read it as ' n power 4'.

Ans: $n \times n \times n \times n$, read as ' n power 4'

10. Find the square of 31. [2]

$31^2 = 31 \times 31$

$31 \times 1 = 31$

$31 \times 3 = 93$, written one place to the left: 930

$31 + 930 = 961$

$\therefore 31^2 = 961$

Ans: 961

11. Write 15^3 as a product and find its value. [3]

$15^3 = 15 \times 15 \times 15$

$15 \times 15 = 225$, $225 \times 15 = 3375$

$\therefore 15^3 = 3375$

Ans: 3375

12. Express 1296 in the exponential form (i) with base 6 (ii) with base 36. [5]

(i) Divide by 6 again and again:

$1296 \div 6 = 216$, $216 \div 6 = 36$, $36 \div 6 = 6$

$1296 = 6 \times 6 \times 6 \times 6 = 6^4$

(ii) Divide by 36 again and again:

$1296 \div 36 = 36$

$1296 = 36 \times 36 = 36^2$

Ans: (i) 6^4 (ii) 36^2

13. Which of the numbers 5280, 637, 914 are divisible by 2? [1]

A number is divisible by 2 if the digit at its unit place is 0, 2, 4, 6 or 8.

The digit at the unit place of 5280 is 0, so 5280 is divisible by 2.

The digit at the unit place of 637 is 7, so 637 is not divisible by 2.

The digit at the unit place of 914 is 4, so 914 is divisible by 2.

Ans: 5280, 914

14. Check whether 40026 is divisible by 3. [2]

A number is divisible by 3 if the sum of all its digits is divisible by 3.

Sum of the digits of 40026: $4 + 0 + 0 + 2 + 6 = 12$

12 is divisible by 3 ($12 = 3 \times 4$), so 40026 is divisible by 3.

Ans: Yes, the sum of the digits is 12

15. Find the smallest number greater than 2040 that is divisible by 3. [3]

A number is divisible by 3 if the sum of all its digits is divisible by 3.

2041: $2 + 0 + 4 + 1 = 7$, not divisible by 3

2042: $2 + 0 + 4 + 2 = 8$, not divisible by 3

2043: $2 + 0 + 4 + 3 = 9$, divisible by 3

$\therefore$ The smallest number greater than 2040 that is divisible by 3 is 2043.

Ans: 2043

16. Check whether 92372 is divisible by 4. [2]

A number is divisible by 4 if its last two digits together are divisible by 4.

Last two digits of 92372 together: 72; $72 = 4 \times 18$, so 92372 is divisible by 4.

Ans: Yes, the last two digits 72 are divisible by 4

17. Is 63005 divisible by 5? Give reason. [1]

A number is divisible by 5 if the digit at its unit place is 0 or 5.

The digit at the unit place of 63005 is 5, so 63005 is divisible by 5.

Ans: Yes, the unit digit is 5

18. Check whether 3573 is divisible by 6. [3]

A number is divisible by 6 if it is divisible by both 2 and 3.

The digit at the unit place of 3573 is 3, so 3573 is not divisible by 2.

Sum of the digits of 3573: $3 + 5 + 7 + 3 = 18$

18 is divisible by 3 ($18 = 3 \times 6$), so 3573 is divisible by 3.

$\therefore$ 3573 is not divisible by 6.

Ans: No, it is not divisible by 2

19. Using the divisibility rule for 7, check whether 168, 936 and 518 are divisible by 7. [5]

A number is divisible by 7 if the remaining part minus twice the unit digit is a multiple of 7 (or 0).

168: $16 - 8(2) = 16 - 16 = 0$; it is equal to 0, so 168 is divisible by 7.

936: $93 - 6(2) = 93 - 12 = 81$; $81 = 7 \times 11 + 4$, not a multiple of 7, so 936 is not divisible by 7.

518: $51 - 8(2) = 51 - 16 = 35$; $35 = 7 \times 5$, a multiple of 7, so 518 is divisible by 7.

Ans: 168 and 518 are divisible by 7; 936 is not.

20. Check whether 81930 is divisible by 2, 3, 4, 5 and 6. [5]

By 2: The digit at the unit place of 81930 is 0, so 81930 is divisible by 2.

By 3: Sum of the digits of 81930: $8 + 1 + 9 + 3 + 0 = 21$; 21 is divisible by 3 ($21 = 3 \times 7$), so 81930 is divisible by 3.

By 4: Last two digits of 81930 together: 30; $30 = 4 \times 7 + 2$, so 81930 is not divisible by 4.

By 5: The digit at the unit place of 81930 is 0, so 81930 is divisible by 5.

By 6: 81930 is divisible by both 2 and 3, so it is divisible by 6.

$\therefore$ 81930 is divisible by 2, 3, 5 and 6.

Ans: Divisible by 2, 3, 5 and 6; not by 4
