

Primary Number System

Question Paper, Set 02

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. Write the whole numbers less than 6. [1 mark]
2. Write the even numbers between 31 and 41. [1 mark]
3. Write the first eight multiples of 13. [3 marks]
4. Write all the divisors of 33. [2 marks]
5. Write 96 as a product of two numbers in all possible ways and hence write all its divisors. How many divisors are there? [5 marks]
6. What is a variable? Give two examples. [1 mark]
7. Write $-1 \times y$ in short form. [1 mark]
8. Simplify: (i) $m + m + m + m + m + m$ (ii) $9m + 7m$ [2 marks]
9. Write $y \times y \times y$ in exponential form and write how it is read. [2 marks]
10. Find the square of 34. [2 marks]
11. Write 6^5 as a product and find its value. [3 marks]
12. Express 6561 in the exponential form (i) with base 9 (ii) with base 81. [5 marks]
13. Which of the numbers 463, 718, 2095 are divisible by 2? [1 mark]
14. Check whether 70412 is divisible by 3. [2 marks]
15. Find the largest number less than 500 that is divisible by 3. [3 marks]
16. Check whether 80254 is divisible by 4. [2 marks]
17. Is 48352 divisible by 5? Give reason. [1 mark]
18. Check whether 4215 is divisible by 6. [3 marks]
19. Using the divisibility rule for 7, check whether 843, 924 and 462 are divisible by 7. [5 marks]

20. Using the divisibility rules, check whether 47835 is divisible by 2, 3, 4, 5 and 6.

[5 marks]

Key sheet

Q	Answer
1	0, 1, 2, 3, 4, 5
2	32, 34, 36, 38, 40
3	13, 26, 39, 52, 65, 78, 91, 104
4	1, 3, 11, 33
5	1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96 (12 divisors)
6	A symbol which takes various numerical values; e.g. y , z
7	$-y$
8	(i) $6m$ (ii) $16m$
9	y^3 , read as ' y power 3' (or) ' y cubed'
10	1156
11	7776
12	(i) 9^4 (ii) 81^2
13	718
14	No, the sum of the digits is 14
15	498
16	No, the last two digits 54 are not divisible by 4
17	No, the unit digit is 2
18	No, it is not divisible by 2
19	924 and 462 are divisible by 7; 843 is not.
20	Divisible by 3 and 5; not by 2, 4, 6

Solutions

1. Write the whole numbers less than 6. [1]

Whole numbers are the natural numbers along with 0: 0, 1, 2, 3, ...

Less than 6: 0, 1, 2, 3, 4, 5

Ans: 0, 1, 2, 3, 4, 5

2. Write the even numbers between 31 and 41. [1]

Even numbers give remainder 0 when divided by 2: 0, 2, 4, 6, ...

Between 31 and 41: 32, 34, 36, 38, 40

Ans: 32, 34, 36, 38, 40

3. Write the first eight multiples of 13. [3]

Multiples of 13: $13 \times 1, 13 \times 2, 13 \times 3, \dots$

$13 \times 1 = 13, 13 \times 2 = 26, 13 \times 3 = 39, 13 \times 4 = 52$

$13 \times 5 = 65, 13 \times 6 = 78, 13 \times 7 = 91, 13 \times 8 = 104$

First eight multiples of 13: 13, 26, 39, 52, 65, 78, 91, 104

Ans: 13, 26, 39, 52, 65, 78, 91, 104

4. Write all the divisors of 33. [2]

$$33 = 1 \times 33$$

$$= 3 \times 11$$

$\therefore$ Factors of 33 are 1, 3, 11, 33

Ans: 1, 3, 11, 33

5. Write 96 as a product of two numbers in all possible ways and hence write all its divisors. How many divisors are there? [5]

$$96 = 1 \times 96$$

$$= 2 \times 48$$

$$= 3 \times 32$$

$$= 4 \times 24$$

$$= 6 \times 16$$

$$= 8 \times 12$$

5, 7, 9 do not divide 96 (they leave a remainder).

$\therefore$ Divisors of 96 are 1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96

Number of divisors = 12

Ans: 1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96 (12 divisors)

6. What is a variable? Give two examples. [1]

A symbol which takes various numerical values is called a variable (or) literal.

Examples: y, z

Ans: A symbol which takes various numerical values; e.g. y, z

7. Write $-1 \times y$ in short form. [1]

As $-1 \times a = -a$:

$$-1 \times y = -y$$

Ans: $-y$

8. Simplify: (i) $m + m + m + m + m + m$ (ii) $9m + 7m$ [2]

(i) $m + m + m + m + m + m$ is m added 6 times.

$$(i) m + m + m + m + m + m = 6m$$

$$(ii) 9m + 7m = (9 + 7)m = 16m$$

Ans: (i) $6m$ (ii) $16m$

9. Write $y \times y \times y$ in exponential form and write how it is read. [2]

y is multiplied 3 times.

$$y \times y \times y = y^3$$

Read it as ' y power 3' (or) ' y cubed'.

Ans: y^3 , read as ' y power 3' (or) ' y cubed'

10. Find the square of 34. [2]

$$34^2 = 34 \times 34$$

$$34 \times 4 = 136$$

$$34 \times 3 = 102, \text{ written one place to the left: } 1020$$

$$136 + 1020 = 1156$$

$$\therefore 34^2 = 1156$$

Ans: 1156

11. Write 6^5 as a product and find its value. [3]

$$6^5 = 6 \times 6 \times 6 \times 6 \times 6$$

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

$$1296 \times 6 = 7776$$

$$\therefore 6^5 = 7776$$

Ans: 7776

12. Express 6561 in the exponential form (i) with base 9 (ii) with base 81. [5]

(i) Divide by 9 again and again:

$$6561 \div 9 = 729, 729 \div 9 = 81, 81 \div 9 = 9$$

$$6561 = 9 \times 9 \times 9 \times 9 = 9^4$$

(ii) Divide by 81 again and again:

$$6561 \div 81 = 81$$

$$6561 = 81 \times 81 = 81^2$$

Ans: (i) 9^4 (ii) 81^2

13. Which of the numbers 463, 718, 2095 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 463 is 3, so 463 is not divisible by 2.

The digit at the unit place of 718 is 8, so 718 is divisible by 2.

The digit at the unit place of 2095 is 5, so 2095 is not divisible by 2.

Ans: 718

14. Check whether 70412 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 70412: $7 + 0 + 4 + 1 + 2 = 14$

14 is not divisible by 3 ($14 = 3 \times 4 + 2$), so 70412 is not divisible by 3.

Ans: No, the sum of the digits is 14

15. Find the largest number less than 500 that is divisible by 3. [3]

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

499: $4 + 9 + 9 = 22$, not divisible by 3

498: $4 + 9 + 8 = 21$, divisible by 3

$\therefore$ The largest number less than 500 that is divisible by 3 is 498.

Ans: 498

16. Check whether 80254 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 80254 together: 54; $54 = 4 \times 13 + 2$, so 80254 is not divisible by 4.

Ans: No, the last two digits 54 are not divisible by 4

17. Is 48352 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 48352 is 2, so 48352 is not divisible by 5.

Ans: No, the unit digit is 2

18. Check whether 4215 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 4215 is 5, so 4215 is not divisible by 2.

Sum of the digits of 4215: $4 + 2 + 1 + 5 = 12$

12 is divisible by 3 ($12 = 3 \times 4$), so 4215 is divisible by 3.

$\therefore$ 4215 is not divisible by 6.

Ans: No, it is not divisible by 2

19. Using the divisibility rule for 7, check whether 843, 924 and 462 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).

843: $84 - 3(2) = 84 - 6 = 78$; $78 = 7 \times 11 + 1$, not a multiple of 7, so 843 is not divisible by 7.

924: $92 - 4(2) = 92 - 8 = 84$; $84 = 7 \times 12$, a multiple of 7, so 924 is divisible by 7.

462: $46 - 2(2) = 46 - 4 = 42$; $42 = 7 \times 6$, a multiple of 7, so 462 is divisible by 7.

Ans: 924 and 462 are divisible by 7; 843 is not.

20. Using the divisibility rules, check whether 47835 is divisible by 2, 3, 4, 5 and 6. [5]

By 2: The digit at the unit place of 47835 is 5, so 47835 is not divisible by 2.

By 3: Sum of the digits of 47835: $4 + 7 + 8 + 3 + 5 = 27$; 27 is divisible by 3 ($27 = 3 \times 9$), so 47835 is divisible by 3.

By 4: Last two digits of 47835 together: 35; $35 = 4 \times 8 + 3$, so 47835 is not divisible by 4.

By 5: The digit at the unit place of 47835 is 5, so 47835 is divisible by 5.

By 6: 47835 is not divisible by both 2 and 3, so it is not divisible by 6.

$\therefore$ 47835 is divisible by 3 and 5.

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