Exercise 2F

(a) 3333333
Consider the number 3333333.
Sum of its digits in odd places (3 + 3 + 3 + 3) = 12
Sum of its digits in even places (3 + 3 + 3) = 9
Difference of the two sums = 12 − 9 = 3
Since this number (3) is not divisible by 11, 3333333 is not divisible by 11.

(b) 1111111
Consider the number 1111111.
Sum of its digits in odd places (1 + 1 + 1 + 1) = 4
Sum of its digits in even places (1 + 1 + 1) = 3
Difference of the two sums = 4 − 3 = 1
Since this number (1) is not divisible by 11, 1111111 is also not divisible by 11.

(c) 22222222
Consider the number 22222222.
Sum of its digits in odd places (2 + 2 + 2 + 2)= 8
Sum of its digits in even places (2 + 2 + 2 + 2) = 8
Difference of the two sums = 8 − 8 = 0
Since this number (0) is divisible by 11, 22222222 is also divisible by 11.

Q7

**Answer :**

(d) 97

(a) 81 is not a prime number because 81 can be written as 9×9.
(b) 87 is not a prime number because 87 can be written as 29×3.
(c) 91 is not a prime number because 91 can be written as 13×7.
(d) 97 is a prime number.

Q8

**Answer :**

(c) 179

(a) 117 is not a prime number because 117 can be written as 3 × 39.
(b) 171 is not a prime number because 171 can be written as 19×9.
(c) 179 is prime number.

Q9

**Answer :**

(c)263

(a) 323 is not a prime number because 323 can be written as 17 × 19.
(b) 361 is not a prime number because 361 can be written as 19 × 19.
(c) 263 is a prime number.

Q10

**Answer :**

(b) 9, 10

(a) 8, 12 are not co-primes as they have a common factor 4.
(b) 9, 10 are co-primes as they do not have a common factor.
(c) 6, 8 are not co-primes as they have a common factor 2.
(d)15,18 are not co-primes as they have a common factor 3.

Q11

**Answer :**

(c) 32

(a) 23 is not a composite number as it cannot be broken into factors.
(b) 29 is not a composite number as it cannot be broken into factors.
(c) 32 is a composite number as it can be broken into factors, which are 2 × 2 × 2 × 2 × 2.

Q12

**Answer :**

(d) $2 \times 3^2 = 18$

We first factorise the two numbers:

| | |
|---|---|
| 2 | 144 |
| 2 | 72 |
| 2 | 36 |
| 2 | 18 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

| | |
|---|---|
| 2 | 198 |
| 3 | 99 |
| 3 | 33 |
| 11 | 11 |
| | 1 |

$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 2^4 \times 3^2$

$198 = 2 \times 3 \times 3 \times 11 = 2 \times 3^2 \times 11$

Here, 18 ($2 \times 3^2 = 18$) is the highest common factor of the two numbers.

Q13

**Answer :**

(a) $2^2 \times 3 = 12$

We will first factorise the two numbers:

| | |
|---|---|
| 2 | 144 |
| 2 | 72 |
| 2 | 36 |
| 2 | 18 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

| | |
|---|---|
| 2 | 180 |
| 2 | 90 |
| 3 | 45 |
| 3 | 15 |
| 5 | 5 |
| | 1 |

| | |
|---|---|
| 2 | 192 |
| 2 | 96 |
| 2 | 48 |
| 2 | 24 |
| 2 | 12 |
| 2 | 6 |
| 3 | 3 |
| | 1 |

$144 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 2^4 \times 3^2$

$180 = 2 \times 2 \times 3 \times 3 \times 5 = 2^2 \times 3^2 \times 5$

$192 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 = 2^6 \times 3$

Here, 12 (i.e. $2^2 \times 3 = 12$) is the highest common factor of the three numbers.

Q14

**Answer :**

(b) 161 and 192

(a) 39 and 91 are not co-primes as 39 and 91 have a common factor, i.e. 13.
(b) 161 and 192 are co-primes as 161 and 192 have no common factor other than 1.
(c) 385 and 462 are not co-primes as 385 and 462 have common factors 7 and 11.

Q15

**Answer :**

(d) $\frac{17}{23}$

$\frac{289}{391}$

H.C.F.=17

Dividing both the numerator and the denominator by the H.C.F. of 289 & 391:

| 17 | 289 |
|---|---|
| **17** | 17 |
| | **1** |

| 17 | 391 |
|---|---|
| 23 | 23 |
| | 1 |

$\frac{289 \div 17}{391 \div 17} = \frac{17}{23}$

Q16

**Answer :**

(d) 11
Since we need 2 as the remainder, we will subtract 2 from each of the numbers.
167 − 2 = 165
134 − 2 = 132
Now, any of the common factors of 165 and 132 will be the required divisor.
On factorising:
165 = 3 × 5 × 11
132 = 2 × 2 × 3 × 11
Their common factors are 11 and 3.
So, 11 is the required divisor.

********** END **********