Q6. (i) ~~Find~~

Ex-8(C)

1. Using the common multiple method, find the L.C.M of the following :

(i) 8, 12 and 24

~~Multiples~~ M_8 = 8, 16, (24), 32, 40, (48), 56, 64, (72), 80, 88, (96)
M_{12} = 12, (24), 36, (48), 60, (72), 84, (96), 108, 120
M_{24} = (24), (48), (72), (96), 120, 144, 168, 192, 216, 240

(24), 48, 72, 96 LCM = 24

(ii) 10, 15 and 20

M_{10} = 10, 20, 30, 40, 50, (60), 70, 80, 90, 100
M_{15} = 15, 30, 45, (60), 75, 90, 105, 120, 135, 150
M_{20} = 20, 40, (60), 80, 100, 120, 140, 160, 180, 200

(60) LCM = 60

(iii) 3, 6, 9 and 12

M_3 = 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, (36), 39, 42
M_6 = 6, 12, 18, 24, 30, (36), 42, 48, 54, 60, 66, 72, 78, 84
M_9 = 9, 18, 27, (36), 45, 54, 63, 72, 81, 90, 99, 108, 117, 126
M_{12} = 12, 24, (36), 48, 60, 72, 84, 96, 108, 120, 132, 144, 156

LCM = 36

2. Find the L.C.M of each of the following groups of numbers, using (i) the prime factor method and (ii) the common division method:

(i) 18, 24, and 96

2 | 18	2 | 24	2 | 96
3 | 9	2 | 12	2 | 48
3	2 | 6	2 | 24
	3	2 | 12
		2 | 6
		3

$18 = 2 \times 3 \times 3$

$24 = 2 \times 2 \times 2 \times 3$

$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$

~~$2 \times 3 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times$~~

~~2×3~~

~~$= 2^7 \times 3^2$~~

$2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 2^5 \times 3^2 = 288$

2 | 18, 24, 96	
3 | 9, 12, 48	
4 | 3, 4, 16	$2 \times 3 \times 4 \times 3 \times 1 \times 4 = 288$
3, 1, 4	

(ii) 100, 150 and 200

2 | 100	2 | 150	2 | 200
2 | 50	3 | 75	2 | 100
5 | 25	5 | 25	2 | 50
5	5	5 | 25
		5

$100 = 2 \times 2 \times 5 \times 5$

$150 = 2 \times 3 \times 5 \times 5$

$200 = 2 \times 2 \times 2 \times 5 \times 5$

$2 \times 5 \times 5 \times 2 \times 2 \times 3 = 600$

2 | 100, 150, 200	
5 | 50, 75, 100	
5 | 10, 15, 20	
2 | 2, 3, 4	$2 \times 5 \times 5 \times 2 \times 1 \times 3 \times 2$
1, 3, 2	$= 600$

(iii) 14, 21 and 98

2|14 3|21 2|98 7|49 7

14 = 2 × 7
21 = 3 × 7
98 = 2 × 7 × 7

2 × 7 × 7 × 3
= 294

7|14, 21, 98
2, 3,

7|14, 21, 98
2|2, 3, 14
1, 3, 7

(iv) 22, and 121 and 33

2|22 11|121 3|33
11 11 11

22 = 2 × 11
121 = 11 × 11
33 = 3 × 11

11|22, 121, 33
2, 11, 3

11 × 11 × 2 × 3 = 726

(v) 34, 85 and 51

2|34 5|85 3|51
17 17 17

34 = 2 × 17
85 = 5 × 17
51 = 3 × 17

17 × 2 × 5 × 3 = 510

17|34, 85, 51
2, 5, 3

3. The H·C·F and the L·C·M of two numbers are 50 and 300 respectively. If one of the numbers is 150, find the other one.

HCF and LCM of two numbers = 50 and 300
One number is = 150
Other number is = 100

So, Here HCF = 50
LCM = 300
A = 150
B = ?

$\Rightarrow B = \frac{HCF \times LCM}{A} = \frac{50 \times 300}{150} = \frac{15,000}{150} = 100$

Ans- Therefore, the other number is 100.

4. The product of two numbers is 432 and their LCM is 72. Find their HCF.

Product of two numbers = 432
L·C·M is = 72
HCF is = 6

So, here = A and B = 432
LCM = 72
HCF = ?

$\Rightarrow HCF = \frac{A \times B}{LCM} = \frac{432}{72} = 6$

72 ⟌ 432

Ans- Therefore, the H·C·F is 6.

5. The product of two numbers is 19,200 and their HCF is 40. Find their LCM.

Product of two numbers = 19,200
H.C.F is = 40
L.C.M is =

So, here = Product = 19,200
HCF = 40
LCM = ?

$\Rightarrow LCM = \frac{\text{Product}}{HCF} = \frac{19,200}{40} = 480$

Ans- So, the LCM is 480.

6. Find the smallest number which, when divided by 12, 15, 18, 24 and 36 leaves no remainder.

So, we need to find the L.C.M of 12, 15, 18, 24 and 36

3	12, 15, 18, 24, 36
2	4, 5, 6, 8, 12
2	2, 5, 3, 4, 6
3	1, 5, 3, 2, 3
	1, 5, 1, 2, 1

$3 \times 2 \times 2 \times 3 \times 5 \times 2 = 360$

7. Find the smallest number which, when increased by one is exactly divisible by 12, 18, 24, 32 and 40

2	12, 18, 24, 32, 40
2	6, 9, 12, 16, 20
2	3, 9, 6, 8, 10
3	3, 9, 3, 4, 5
	1, 3, 1, 4, , 5

$2 \times 2 \times 2 \times 3 \times 3 \times 4 \times 5 = 1440$

1440 (increased by one)

$= 1439$

8. Find the smallest number which, on being decreased by 3, is completely divisible By 18, 36, 32 and 27.

$$\begin{array}{r|l} 2 & 18, 36, 32, 27 \\ \hline 3 & 9, 18, 16, 27 \\ \hline 3 & 3, 6, 16, 9 \\ \hline 2 & 1, 2, 16, 3 \\ \hline & 1, 1, 8, 3 \end{array}$$

LCM = $2 \times 3 \times 3 \times 2 \times 8 \times 3 = 2^2 \times 3^3 \times 8 = 864$

Ans- So, the required number is = $\begin{array}{r} 864 \\ +\ 3 \\ \hline 867 \end{array}$