Exercise 8(B)

1. using the common factor method, find the H.C.F of:

i) 16 and 35

factors of 16- 1, 2, 4, 8, 16
factors of 35- 1, 5, 7, 35

factors that are common to 16 and 25 = 1
HCF = 1

ii) 25 and 20

factor of 25 = 1, 5, 25
factors of 20 = 1, 2, 4, 5, 10, 20

factors that are common to 25 and 20 = 1X5

HCF-5

iii) 27 and 75

factors of 27- 1, 3, 9, 27
factors of 75- 1, 3, 5, 25, 75

factors that are common to 27 and 75 = 1X3

HCF - 3

iv) 8, 12, 18

factors of 8 - 1, 2, 4, 8
factors of 12 - 1, 2, 3, 4, 6, 12
factors of 18 - 1, 2, 3, 9, 6, 18

factors that are common factors of 8, 12, 18 = 1 x 2

HCF - 2

v) factors of 24 - 1, 2, 3, 4, 6, 8, 12, 24
factors of 36 - 1, 2, 3, 6, 18, 4, 9, 36
factors of 45 - 1, 3, 9, 15, 45
factors of 60 - 1, 2, 3, 6, 10, 4, 5, 15, 20, 30, 60

Common factors of 24, 36, 45 and 60 = 1 x 3

HCF - 3

2. Using the prime factor method, find the H.C.F. of:

i) 5 and 8

5 = 1 x 5
8 = 2 x 2 x 2 x 1

HCF - 1

5 | 5
1 | 1

2 | 8
2 | 4
2 | 2
1

ii) 24 and 119

$24 = 2 \times 2 \times 2 \times 3 \times 1$

$49 = 7 \times 7 \times 1$

HCF of 24 and 49 = 1

HCF - 1

2 | 24
2 | 12
2 | 6
3 | 3
1	

7 | 49
7 | 7
1	

iii) 40, 60 and 80

$40 = 2 \times 2 \times 2 \times 5$

$60 = 2 \times 2 \times 3 \times 5$

$80 = 2 \times 2 \times 2 \times 2 \times 5$

2 | 40
2 | 20
2 | 10
5	

2 | 60
2 | 30
3 | 15
5	

2 | 80
2 | 40
2 | 20
2 | 10
5	

common factors = 2, 2 and 5

$= 2 \times 2 \times 5$

$= 20$

IV) 48, 84 and 88

$48 = 2 \times 2 \times 2 \times 2 \times 3$

$84 = 2 \times 2 \times 3 \times 7$

$88 = 2 \times 2 \times 2 \times 11$

2 | 48
2 | 24
2 | 12
2 | 6
3	

2 | 84
2 | 42
3 | 21
7	

2 | 88
2 | 44
2 | 23
11	

common factor = 2 × 2

HCF = 4

5) If P_n means prime factors of n, find:

i) $P_6 = 2 \times 3$
$= 2$ and 3

ii) P_{24} - 2 and 3

iii) P_{50} - 2 and 5

iv) P_{42} - 2, 3 and 7

Exercise - 8 (B)

1) Using the common factor method, find the H.C.F of:

i) 16 and 35
16 = (1), 2, 4, 8, 16

35 = (1), 5, 7, 35

HCF of 16 and 35 = 1

ii) 25 and 20
25 = (1), (5), 25

20 - (1), 2, 4, (5), 10, 20

Common factors - 1 and 5

HCF of 25 and 20 = 5

iii) 27 and 75
27 - ①, ③, 9, 27

75 - ①, ③, 5, 15, 75

Common factors = 1 and 3

HCF of 27 and 75 = 3

iv) 8, 12 and 18
8 = ①, ②, 4, 8

12 = ①, ②, 4, 6, 12

18 = ①, ②, 3, 6, 9, 18

Common factors = 1 and 2

H.C.F of 8, 12 and 18 = 2

v) 24, 36, 45 and 60
24 = ①, 2, ③, 4, 6, 12, 24

36 = ①, 2, ③, 4, 6, 12, 18, 36

45 = ①, ③, 5, 9, 15, 45.

60 = ①, 2, ③, 4, 5, 6, 10, 12, 15, 20, 30, 60

Common factors = 1 and 3

H.C.F of 24, 36, 45 and 60 = 3

2) Using the prime factor method, find the H.C.F of:

i) 5 and 8

$5 = 1 \times 5$

$8 = 2 \times 2 \times 2 \times 1$

1|5	2|8
5	2|4
	2|2
	1

H.C.F of 5 and 8 = 1

ii) 24 and 49

$24 = 2 \times 2 \times 2 \times 3 \times 1$

$49 = 7 \times 7 \times 1$

2|24	7|49
2|12	7|7
2|6	1
3|3	
1	

H.C.F of 24 and 49 = 1

iii) 40, 60 and 80

$40 = 2 \times 2 \times 2 \times 5$

$60 = 2 \times 2 \times 3 \times 5$

$80 = 2 \times 2 \times 2 \times 2 \times 5$

2|40	2|60	2|80
2|20	2|30	2|40
2|10	3|15	2|20
5	5	2|10
		5

Common factors = 2, 2 and 5

$= 2 \times 2 \times 5$

$= 20$

iv) 48, 84 and 88

$48 = 2 \times 2 \times 2 \times 2 \times 3$

$84 = 2 \times 2 \times 3 \times 7$

$88 = 2 \times 2 \times 2 \times 11$

Common factor = 2 x 2

HCF = 4

2|48	2|84	2|88
2|24	2|42	2|44
2|12	3|21	2|22
2|6	7	11
3		

v) 12, 16 and 28

$12 = 2 \times 2 \times 3$

$16 = 2 \times 2 \times 2 \times 2$

$28 = 2 \times 2 \times 7$

2|12	2|16	2|28
2|6	2|8	2|14
3	2|4	7
	2	

Common factors $= 2 \times 2$

$= 4$

H.C.F of 12, 16 and 28 = 4

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3) Using the division method, find the H.C.F of the following

i) 16 and 24

```
16 | 24 | 1
   -16
    8 | 16 | 2
       -16
         0
```

H.C.F of 16 and 24 = 8

ii) 18 and 30

```
18 | 30 | 1
   -18
   12 | 18 | 1
       -12
        6 | 12 | 2
           -12
            0
```

H.C.F of 18 and 30 = 6

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iii) 7, 14 and 24

```
7 | 14 | 2        7 | 24 | 3
  14               21
   0                3 | 7 | 2
                      6
                      1 | 3 | 3
                          3
                          0
```

H.C.F of 7, 14 and 24 = 1

iv) 70, 80, 120 and 150

```
70 | 80 | 1      10 | 120 | 12     10 | 150 | 15
  70                120               150
  10 | 70 | 7       0                 0
     70
      0
```

H.C.F of 70, 80, 120 and 150 = 10

v) 32, 56 and 46

```
32 | 46 | 1        2 | 56 | 28
   32                56
   14 | 32 | 2        0
      28
      4 | 14 | 3
        12
        2 | 4 | 2
            4
            0
```

H.C.F of 32, 56 and 46 = 2

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4) Use a method of your choice to find the H.C.F of.

i) 45, 75 and 135

```
45 | 75 | 1
  -45
  30 | 45 | 1
     -30
     15 | 30 | 2
        -30
         0
```

```
15 | 135 | 9
    135
      0
```

H.C.F of 45, 75 and 135 = 15

ii) 48, 36 and 96

```
36 | 48 | 1
  -36
  12 | 36 | 3
     -36
      0
```

```
12 | 96 | 8
   -96
    0
```

H.C.F of 48, 36 and 96 = 12

iii) 66, 33 and 132

```
33 | 66 | 2
  -66
   0
```

```
33 | 132 | 4
   -132
    0
```

H.C.F of 66, 33 and 132 = 33

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H.C.F of:

iv) 24, 36, 60 and 132

```
24|36|1        12|60|5        12|132|11
 -24            -60             -132
 12|24|2          0               0
  -24
   0
```

H.C.F of ~~[illegible]~~ 24, 36, 60 and 132 = 12

v) 30, 60, 90 and 105

```
30|60|2        30|90|3        30|105|3
 -60            -90             -90
  0               0              15|30|2
                                  -30
                                   0
```

H.C.F of 30, 60, 90 and 105 = 15

5) Find the greatest number that divides each of 180, 225 and 315 completely.

```
180|225|10          45|315|7
  -180               -315
   45|180|4            0
    -180
     0
```

The greatest number that divides each of 180, 225 and 315 completly is = 45

23.06.21

8) Find the greatest number that divides each of 180, 225 and 315 completly.

Required number is the H.C.F of (93-3), (111-3), (129-3)

= H.C.F of 90, 108 and 126

90 and 108

$$\begin{array}{r|l} 90 \overline{)108} & 1 \\ -90 & \\ \hline 18 \overline{)90} & 5 \\ -90 & \\ \hline 0 & \end{array}$$

H.C.F of 90 and 108 is 18

18 and 126

$$\begin{array}{r|l} 18 \overline{)126} & 7 \\ -126 & \\ \hline 0 & \end{array}$$

Required number is = 18