EXPLANATIONS

TYPE-I

1. (3) Using Rule 1,
Required number

$$= \frac{LCM \times HCF}{\text{First number}}$$

$$= \frac{864 \times 144}{288} = 432$$

2. (3) Using Rule 1,
LCM × HCF = 1st Number× 2nd Number
$\Rightarrow$ 225 × 5 = 25 × x

$$\therefore x = \frac{225 \times 5}{25} = 45$$

3. (3) Using Rule 1,
Given that
L.C.M. of two numbers = 1820
H.C.F. of those numbers = 26
One of the number is 130
$\therefore$ Another number

$$= \frac{1820 \times 26}{130} = 364$$

4. (2) Using Rule 1,
We have,
First number × second number = LCM × HCF
$\therefore$ Second number

$$= \frac{1920 \times 16}{128} = 240$$

5. (1) Using Rule 1,
Product of two numbers
= HCF × LCM
$\Rightarrow$ 12906 × 14818
= LCM × 478

$$\Rightarrow LCM = \frac{12906 \times 14818}{478}$$

= 400086

6. (4) Using Rule 1,
H.C.F. of the two 2-digit numbers = 16
Hence, the numbers can be expressed as $16x$ and $16y$, where x and y are prime to each other.
Now,
First number × second number = H.C.F. × L.C.M.
$\Rightarrow 16x \times 16y = 16 \times 480$

$$\Rightarrow xy = \frac{16 \times 480}{16 \times 16} = 30$$

The possible pairs of x and y, satisfying the condition $xy = 30$ are : (3, 10), (5, 6), (1, 30), (2, 15)
Since the numbers are of 2-digits each.
Hence, admissible pair is (5, 6)
$\therefore$ Numbers are : 16 × 5 = 80 and 16 × 6 = 96

7. (2) Using Rule 1,
We know that,
First number × Second number = LCM × HCF
$\Rightarrow$ Second number

$$= \frac{16 \times 160}{32} = 80$$

8. (2) Using Rule 1,

$$LCM = \frac{\text{Product of two numbers}}{HCF}$$

$$= \frac{4107}{37} = 111$$

Obviously, numbers are 111 and 37 which satisfy the given condition.
Hence, the greater number = 111

9. (2) Using Rule 1,
First number × Second number = HCF × LCM
$\therefore$ Second number

$$= \frac{15 \times 300}{60} = 75$$

10. (3) Let the numbers be $12x$ and $12y$ where x and y are prime to each other.
$\therefore LCM = 12xy$
$\therefore 12xy = 924$
$\Rightarrow xy = 77$
$\therefore$ Possible pairs = (1,77) and (7,11)

11. (3) Using Rule 1,
First number × second number = LCM × HCF
Let the second number be x.
$\therefore 10x = 30 \times 5$

$$\Rightarrow x = \frac{30 \times 5}{10} = 15$$

12. (1) Using Rule 1,
HCF × LCM = Product of two numbers
$\Rightarrow$ 8 × LCM = 1280

$$\Rightarrow LCM = \frac{1280}{8} = 160$$

13. (4) Using Rule 1,
First number × second number = HCF × LCM
$\Rightarrow$ 24 × second number = 8 × 48

$$\therefore \text{Second number} = \frac{8 \times 48}{24} = 16$$

14. (2) Using Rule 1,
First number × second number = HCF × LCM
$\Rightarrow$ 84 × second number = 12 × 336
$\therefore$ Second number

$$= \frac{12 \times 336}{84} = 48$$

15. (4) Let the numbers be $6x$ and $6y$ where x and y are prime to each other.
$\therefore 6x \times 6y = 216$

$$\Rightarrow xy = \frac{216}{6 \times 6} = 6$$

$\therefore LCM = 6xy = 6 \times 6 = 36$

16. (1) Using Rule 1,
Second number

$$= \frac{HCF \times LCM}{\text{First number}}$$

$$= \frac{18 \times 378}{54} = 126$$

17. (3) Let the number be $15x$ and $15y$, where x and y are co –prime.
$\therefore 15x \times 15y = 6300$

$$\Rightarrow xy = \frac{6300}{15 \times 15} = 28$$

So, two pairs are
(7, 4) and (14, 2)

18. (4) Using Rule 1,
First number × Second number = HCF × LCM
$\Rightarrow$ 75 × Second number = 15 × 225
$\therefore$ Second number

$$= \frac{15 \times 225}{75} = 45$$

19. (1) Using Rule 1,
First number × second number = HCF × LCM
$\Rightarrow$ 52 × second number = 4 × 520
$\Rightarrow$ Second number

$$= \frac{4 \times 520}{52} = 40$$

20. (4) Using Rule 1,
First number × Second number = HCF × LCM
$\Rightarrow$ 864 × Second number
= 96 × 1296 $\Rightarrow$ Second number

$$= \frac{96 \times 1296}{864} = 144$$

21. (2) Using Rule 1,
Let LCM be L and HCF be H, then
L = 4H
$\therefore$ H + 4H = 125
$\Rightarrow$ 5H = 125
$\Rightarrow H = \frac{125}{5} = 25$
$\therefore$ L = 4 × 25 = 100
$\therefore$ Second number
$= \frac{L \times H}{\text{First number}}$
$= \frac{100 \times 25}{100} = 25$

22. (1) HCF of two-prime numbers = 1
$\therefore$ Product of numbers = their LCM = 117
117 = 13 × 9 where 13 & 9 are co-prime. L.C.M (13,9) = 117.

23. (2) HCF = 12
Numbers = $12x$ and $12y$
where x and y are prime to each other.
$\therefore 12x \times 12y = 2160$
$\Rightarrow xy = \frac{2160}{12 \times 12}$
= 15 = 3 × 5, 1 × 15
Possible pairs = (36, 60) and (12, 180)

24. (1) Using Rule 1,
Second number
$= \frac{\text{H.C.F.} \times \text{L.C.M.}}{\text{First Number}}$
$= \frac{27 \times 2079}{189} = 297$

25. (2) Here, HCF = 13
Let the numbers be 13x and 13y where x and y are Prime to each other.
Now, 13x × 13y = 2028
$\Rightarrow xy = \frac{2028}{13 \times 13} = 12$
The possible pairs are : (1, 12), (3, 4), (2, 6)
But the 2 and 6 are not co-prime.
$\therefore$ The required no. of pairs = 2

26. (2) HCF = 13
Let the numbers be $13x$ and $13y$.
Where x and y are co-prime.
$\therefore$ LCM = $13xy$
$\therefore$ $13xy$ = 455
$\therefore xy = \frac{455}{13} = 35 = 5 \times 7$
$\therefore$ Numbers are 13 × 5 = 65 and 13 × 7 = 91

27. (4) HCF of two numbers is 8. This means 8 is a factor common to both the numbers. LCM is common multiple for the two numbers, it is divisible by the two numbers. So, the required answer = 60

28. (4) Let the numbers be $23x$ and $23y$ where x and y are co-prime.
$\therefore$ LCM = $23xy$
As given,
$23xy = 23 \times 13 \times 14$
$\therefore x = 13, y = 14$
$\therefore$ The larger number = $23y$
= 23 × 14 = 322

29. (4) LCM = 2 × 2 × 2 × 3 × 5
Hence, HCF = 4, 8, 12 or 24
According to question
35 cannot be H.C.F. of 120.

30. (3) Using Rule 1,
First number = 2 × 44 = 88
$\therefore$ First number × Second number
= H.C.F. × L.C.M.
$\Rightarrow$ 88 × Second numebr
= 44 × 264
$\Rightarrow$ Second number
$= \frac{44 \times 264}{88} = 132$

TYPE-II

1. (3) Using Rule 4,
L.C.M. of 4, 6, 8, 12 and 16 = 48
$\therefore$ Required number
= 48 + 2 = 50

2. (4) Using Rule 4,
LCM of 15, 12, 20, 54 = 540
Then number = 540 + 4 = 544
[4 being remainder]

3. (4) Using Rule 4,
The greatest number of five digits is 99999.
LCM of 3, 5, 8 and 12

2	3,	5,	8,	12
2	3,	5,	4,	6
3	3,	5,	2,	3
	1,	5,	2,	1

$\therefore$ LCM = 2 × 2 × 3 × 5 × 2 = 120
After dividing 99999 by 120, we get 39 as remainder
99999 – 39 = 99960
= (833 × 120)
99960 is the greatest five digit number divisible by the given divisors.
In order to get 2 as remainder in each case we will simply add 2 to 99960.
$\therefore$ Greatest number
= 99960 + 2 = 99962

4. (3) Using Rule 4,
LCM of 4, 5, 6, 7 and 8

= 2	4,	5,	6,	7,	8
2	2,	5,	3,	7,	4
	1,	5,	3,	7,	2

= 2 × 2 × 2 × 3 × 5 × 7 = 840.
let required number be 840 K + 2 which is multiple of 13.
Least value of K for which (840 K + 2) is divisible by 13 is K = 3
$\therefore$ Required number
= 840 × 3 + 2
= 2520 + 2 = 2522

5. (4) Required time = LCM of 252, 308 and 198 seconds

2	252,	308	198
2	126,	154,	99
7	63,	77,	99
9	9,	11,	99
11	1,	11,	11
	1,	1,	1

$\therefore$ LCM = 2 × 2 × 7 × 9 × 11
= 2772 seconds
= 46 minutes 12 seconds

6. (2) 15 = 3 × 5
$18 = 3^2 \times 2$
21 = 3 × 7
$24 = 2^3 \times 3$
LCM = 8 × 9 × 5 × 7 = 2520
The largest number of four digits = 9999

2520)9999(3
7560
2439

Required number
= 9999 – 2439 – 4 = 7556
(Because 15 – 11 = 4
18 – 14 = 4
21 – 17 = 4
24 – 20 = 4)

7. (3) LCM of 21, 36 and 66
$\therefore$ LCM = 3 × 2 × 7 × 6 × 11
= 3 × 3 × 2 × 2 × 7 × 11
$\therefore$ Required number
$= 3^2 \times 2^2 \times 7^2 \times 11^2$
= 213444

8. (1) Using Rule 5,
Here 4 – 1 = 3, 5 – 2 = 3, 6 – 3 = 3
$\therefore$ The required number
= LCM of (4, 5, 6) – 3
= 60 – 3 = 57

9. (2) LCM of 4, 6, 10, 15 = 60
Least number of 6 digits
= 100000
The least number of 6 digits which is exactly divisible by 60 = 100000 + (60 – 40)
= 100020
∴ Required number (N)
= 100020 + 2 = 100022
Hence, the sum of digits = 1 + 0 + 0 + 0 + 2 + 2 = 5

10. (3) The LCM of 12, 18, 21, 30

2	12,	18,	21,	30
3	6,	9,	21,	15
	2,	3,	7,	5

∴ LCM = 2 × 3 × 2 × 3 × 7 × 5
= 1260
∴ The required number
$= \frac{1260}{2} = 630$

11. (4) We find LCM of = 10, 16, 24

2	10,	16,	24
2	5,	8,	12
2	5,	4,	6
2	5,	2,	3,
3	5,	1,	3
5	5,	1,	1
	1,	1,	1

∴ LCM = $2^2 \times 2^2 \times 3 \times 5$
∴ Required number
= 2 × 2 × 2 × 2 × 3 × 3 × 5 × 5
= 3600

12. (2) Required number of students
= LCM of 6, 8, 10 = 120

13. (2) LCM of 4, 6, 8, 9

2	4,6,8,9
2	2,3,4,9
3	1,3,2,9
	1,1,2,3

∴ LCM = 2 × 2 × 3 × 2 × 3 = 72
∴ Required number = 72, because it is exactly divisible by 4, 6, 8 and 9 and it leaves remainder 7 when divided by 13.

14. (2) Using Rule 5,
Here, 12 – 5 = 7,
16 – 9 = 7
∴ Required number
= (L.C.M. of 12 and 16) – 7
= 48 – 7 = 41

15. (3) Using Rule 5,
Here, Divisor – remainder = 1
e.g., 10 – 9 = 1, 9 – 8 = 1,
8 – 7 = 1
∴ Required number
= (L.C.M. of 10, 9, 8) –1
= 360 – 1 = 359

16. (4) We find LCM of 5, 6 and 8
5 = 5
6 = 3 × 2
8 = 2^3
= $2^3 \times 3 \times 5 = 8 \times 15 = 120$
Required number = 120K + 3
∴ when K = 2, 120 × 2 + 3 = 243 required no.
It is completely divisible by 9

17. (4) LCM of 16, 18, 20 and 25
= 3600
∴ Required number = 3600K + 4 which is exactly divisible by 7 for certain value of K.
When K = 5,
number = 3600 × 5 + 4
= 18004 which is exactly divisible by 7.

18. (2) LCM of 3, 5, 6, 8, 10 and 12
= 120
∴ Required number
= $120x + 2$, which is exactly divisible by 13.
$120x + 2 = 13 \times 9x + 3x + 2$
Clearly $3x + 2$ should be divisible by 13.
For $x = 8, 3x + 2$ is divisible by 13.
∴ Required number
= $120x + 2 = 120 \times 8 + 2$
= 960 + 2 = 962

19. (4) LCM of 6, 9, 15 and 18

2	6,	9,	15,	18
3	3,	9,	15,	9
3	1,	3,	5,	3
	1,	1,	5,	1

∴ LCM = 2 × 3 × 3 × 5 = 90
∴ Required number = $90k + 4$, which must be a multiple of 7 for some value of k.
For $k = 4$,
Number = 90 × 4 + 4 = 364, which is exactly divisible by 7.

20. (2) Using Rule 9,
We will find the LCM of 16, 24, 30 and 36.

2	16,	24,	30,	36
2	8,	12,	15,	18
2	4,	6,	15,	9
3	2,	3,	15,	9
	2,	1,	5,	3

∴ LCM = 2 × 2 × 2 × 3 × 2 × 5 × 3 = 720
The largest number of five digits = 99999
On dividing 99999 by 720, the remainder = 639
∴ The largest five-digit number divisible by 720
= 99999 – 639 = 99360
∴ Required number = 99360 + 10
= 99370

21. (2) LCM of 5, 10, 12, 15

2	5,	10,	12,	15
3	5,	5,	6,	15
5	5,	5,	2,	5
	1,	1,	2,	1

∴ LCM = 2 × 3 × 5 × 2 = 60
∴ Number = $60k + 2$
Now, the required number should be divisible by 7.
Now, $60k + 2 = 7 \times 8k + 4k + 2$
If we put $k = 3$, $(4k + 2)$ is equal to 14 which is exactly divisible by 7.
∴ Required number = 60 × 3 + 2
= 182

22. (3) LCM of 9, 10 and 15 = 90
⇒ The multiple of 90 are also divisible by 9, 10 or 15.
∴ 21 × 90 = 1890 will be divisible by them.
∴ Now, 1897 will be the number that will give remainder 7.
1936 – 1897
Required number
= 1936 – 1897 = 39

23. (1) The difference between the divisor and the corresponding remainder is same in each case ie. 18 – 5 = 13, 27 – 14 = 13, 36 – 23 = 13
∴ Required number
= (LCM of 18, 27, and 36) – 13
= 108 – 13 = 95

24. (2) The LCM of 5, 6, 7 and 8
= 840
∴ Required number = 840 k + 3 which is exactly divisible by 9 for some value of k.
Now, 840 k + 3 = 93 × 9 k + (3k + 3)
When k = 2, 3k + 3 = 9, which is divisible by 9.
∴ Required number
= 840 × 2 + 3 = 1683

25. (1) Using Rule 5,
Here, 12 – 2 = 10; 16 – 6 = 10; 24 – 14 = 10
Now, LCM of 12, 16 and 24 = 48
∴ The greatest 4–digit number exactly divisible by 48 = 9984
∴ Required number
= 9984 – 10 = 9974

26. (1) Using Rule 5,
LCM of 15, 20 and 35 = 420
∴ Required least number
= 420 + 8 = 428

27. (3) Using Rule 5,
The smallest number divisible by 12 or 10 or 8
= LCM of 12, 10 and 8 = 120
⇒ Required number = 120 + 6
= 126

28. (2) LCM of 24, 36 and 54 seconds
= 216 seconds
= 3 minutes 36 seconds
∴ Required time = 10 : 15 : 00 + 3 minutes 36 seconds
= 10 : 18 : 36 a.m.

29. (3) A makes one complete round of the circular track in $\frac{5}{\frac{5}{2}}$ = 2 hours,
B in $\frac{5}{3}$ hours and C in $\frac{5}{2}$ hours.
That is after 2 hours A is at the starting point, B after $\frac{5}{3}$ hours and C after $\frac{5}{2}$ hours.
Hence the required time
= LCM of 2, $\frac{5}{3}$ and $\frac{5}{2}$ hours
$= \frac{\text{LCM of } 2, 5, 5}{\text{HCF of } 3, 2}$
$= \frac{10}{1}$ = 10 hours.

30. (1) Required time = LCM of 200, 300, 360 and 450 seconds
= 1800 seconds

31. (1) LCM of 4, 6, 8, 14
= 168 seconds
= 2 minutes 48 seconds
They ring again at 12 + 2 min. 48 sec.
= 12 hrs. 2 min. 48 sec.

32. (4) $1\frac{1}{2}$ hours = 90 minutes
1 hour and 45 minutes
= 105 minutes
1 hour = 60 minutes
∴ LCM of 30 minutes, 60 minutes, 90 minutes and 105 minutes

3	30,	60,	90,	105
5	10,	20,	30,	35
2	2,	4,	6,	7
	1,	2,	3,	7

∴ LCM = 3 × 5 × 2 × 2 × 3 × 7
= 1260 minutes
1260 minutes $= \frac{1260}{60} = 21$ hours
∴ The bell will again ring simultaneously after 21 hours.
∴ Time will be
= 12 noon + 21 hours
= 9 a.m.

33. (1) The LCM of 5, 6, 8 and 9
= 360 seconds = 6 minutes

34. (2) LCM of 20, 30 and 40 minutes = 120 minutes
Hence, the bells will toll together again after 2 hours i.e. at 1 p.m.

35. (1) The difference between divisor and the corresponding remainder is equal.
LCM of 3, 5, 7 and 9 = 315
Largest 4-digit number = 9999

```
315)9999(31
    945
     549
     315
     234
```

∴ Number divisible by 315
= 9999 – 234 = 9765
Required number
= 9765 – 2 = 9763

36. (3) Required time = LCM of 6, 7, 8, 9 and 12 seconds
= 504 seconds

37. (2) Using Rule 2,
LCM $= \frac{\text{LCM of } 2, 4, 5}{\text{HCF of } 3, 9, 6}$
$= \frac{20}{3}$

38. (2) LCM of 3, 4, 5, 6, 7, 8 = 840

```
840)10000(11
    840
    1600
     840
     760
```

Since, the remainder 760 is more than half of the divisor 840.
∴ The nearest number
= 10000 + (840 – 760) = 10080

39. (2) Using Rule 8,
The largest number of 4-digits is 9999. L.C.M. of divisors

2	12,	15,	18,	27
3	6,	15,	9,	27
3	2,	5,	3,	9
	2,	5,	1,	3

LCM = 2 × 2 × 3 × 3 × 3 × 5
= 540
Divide 9999 by 540, now we get 279 as remainder.
9999 – 279 = 9720
Hence, 9720 is the largest 4-digit number exactly divisible by each of 12, 15, 18 and 27.

40. (2) The smallest number divisible by 16, 20 and 24
= LCM of 16, 20 and 24

2	16,	20,	24
2	8,	10,	12
2	4,	5,	6
	2,	5,	3

∴ LCM = 2×2×2×2×5×3
$= 2^2 \times 2^2 \times 5 \times 3$
∴ Required complete square number $= 2^2 \times 2^2 \times 5^2 \times 3^2 = 3600$

41. (2) LCM of 25, 50 and 75 = 150
On dividing 43582 by 150, remainder = 82

```
150) 43582(290
     300
     1358
     1350
       82
```

∴ Required number
= 43582 + (150 – 82) = 43650

42. (2) Required number = (LCM of 24, 32, 36 and 54) – 5
Now,

2	24,	32,	36,	54
2	12,	16,	18,	27
2	6,	8,	9,	27
3	3,	4,	9,	27
3	1,	4,	3,	9
	1,	4,	1,	3

LCM = 2 × 2 × 2 × 3 × 3 × 3 × 4
= 864
∴ Required number = 864 – 5
= 859

43. (2)

2	20,	28,	32,	35
2	10,	14,	16,	35
5	5,	7,	8,	35
7	1,	7,	8,	7
	1,	1,	8,	1

∴ LCM = 2 × 2 × 5 × 7 × 8
= 1120
∴ Required number
= 5834 – 1120 = 4714

44. (4) The LCM of 6, 12 and 18
= 36 = 6^2

45. (2) Using Rule 8,
LCM of 10, 15 and 20 = 60
Largest 4-digit number = 9999

∴ 60) 9999 (166
60
399
360
399
360
39

∴ Required number
= 9999 – 39 = 9960

46. (4) Using Rule 4,
Required number = (LCM of 15, 20, 36 and 48) + 3

2	15,	20,	36,	48
2	15,	10,	18,	24
3	15,	5,	9,	12
5	5,	5,	3,	4
	1,	1,	3,	4

∴ LCM = 2 × 2 × 3 × 5 × 3 × 4
= 720
∴ Required number
= 720 + 3 = 723

47. (3) Required distance = LCM of 63, 70 and 77 cm.
= 6930 cm.

Illustration :

7	63,	70,	77
	9,	10,	11

∴ LCM = 7 × 9 × 10 × 11
= 6930

48. (2) Required answer = LCM of 36, 40 and 48 seconds
= 720 seconds

$= \left(\frac{720}{60}\right)$ minutes = 12 minutes

Illustration :

2	36,	40,	48
2	18,	20,	24
2	9,	10,	12
3	9,	5,	6
	3,	5,	2

∴ LCM = 2 × 2 × 2 × 2 × 3 × 3 × 5
= 720

49. (2)

2	60
2	30
3	15
	5

∴ 60 = 2 × 2 × 3 × 5
i.e., Numbers = 2, 3, 4 and 5
∴ Required sum
= 2 + 3 + 4 + 5 = 14

50. (1) LCM of x and y = 161
∴ $xy = 23 \times 7$
∴ $x = 23$; $y = 7$
∴ $3y - x = 3 \times 7 - 23$
= 21 – 23 = – 2

51. (1) Required time = LCM of 48, 72 and 108 seconds

2	48,	72,	108
2	24,	36,	54
2	12,	18,	54
3	6,	9,	27
3	2,	3,	9
	2,	1,	3

∴ LCM = 2 × 2 × 2 × 2 × 3 × 3 × 3
= 432 seconds
= 7 minutes 12 second
∴ Required time
= 10 : 07 : 12 hours

TYPE-III

1. (1) Maximum number of students
= The greatest common divisor
= HCF of 1001 and 910 = 91

2. (3) Using Rule 7,
Required number
= HCF of (989 – 5) and (1327 – 7)
= HCF of 984 and 1320 = 24
∴ HCF = 24

3. (2) Using Rule 3,

HCF of $\frac{2}{3}, \frac{4}{5}$ and $\frac{6}{7}$

$= \frac{\text{HCF of 2, 4 and 6}}{\text{LCM of 3, 5 and 7}}$

$= \frac{2}{105}$

4. (1) Using Rule 7,
The greatest number N = HCF of $(1305 - x)$, $(4665 - x)$ and $(6905 - x)$, where x is the remainder
= HCF of (4665 – 1305), (6905–4665) and
(6905 – 1305)
= HCF of 3360, 2240 and 5600

2240) 3360 (1
2240
1120) 2240 (2
2240
×

Again,

1120) 5600 (5
5600
×

∴ N = 1120
Sum of digits
= 1 + 1 + 2 + 0 = 4

5. (1) Using Rule 7,
The number will be HCF of 307 – 3 = 304 and
330 – 7 = 323.

304) 323 (1
304
19) 304 (16
19
114
114
×

∴ Required number = 19

6. (3) Using Rule 7,
3026 –11 = 3015 and
5053 –13 = 5040
Required number = HCF of 3015 and 5040

3015) 5040 (1
3015
2025) 3015 (1
2025
990) 2025 (2
1980
45) 990 (22
90
90
90
×

∴ Required number = 45

7. (1) Using Rule 7,
We have to find HCF of
(1657 – 6 = 1651) and
(2037 – 5 = 2032)
1651 = 13 × 127
2032 = 16 × 127
∴ HCF = 127
So, required number will be 127.

8. (1) Using Rule 7,
Let x be the remainder.
Then, $(25 - x)$, $(73 - x)$, and $(97 - x)$ Will be exactly divisible by the required number.
$\therefore$ Required number
= HCF of $(73 - x) - (25 - x)$, $(97 - x) - (73 - x)$ and $(97 - x) - (25 - x)$
= HCF of (73 –25), (97 –73), and (97 –25) = HCF of 48, 24 and 72 = 24

9. (2) Using Rule 7,
Required number
= HCF of (110 – 2) and (128 – 2)
= HCF of 108 and 126 = 18

10. (3) Required maximum capacity of container
= HCF of 75 l and 45 l
Now, 75 = 5 × 5 × 3
45 = 5 × 3 × 3
$\therefore$ HCF = 15 litres

11. (4) Length of the floor
= 15 m 17 cm = 1517 cm
Breadth of the floor
= 9m 2 cm = 902 cm.
Area of the floor
= 1517 × 902 cm^2
The number of square tiles will be least, when the size of each tile is maximum.
$\therefore$ Size of each tile = HCF of 1517 and 902 = 41
$\therefore$ Required number of tiles

$$= \frac{1517 \times 902}{41 \times 41} = 814$$

12. (1) Number of books in each stack = HCF of 336, 240, 96 = 48

240) 336 (1
240
96) 240 (2
192
48) 96 (2
96
×

48) 96 (2
96
×

$\therefore$ Total number of stacks

$$= \frac{336}{48} + \frac{240}{48} + \frac{96}{48}$$

=7 + 5 + 2 = 14

13. (3) First of all we find the HCF of 945 and 2475. HCF = 45
Illustration :

945) 2475 (2
1890
585) 945 (1
585
360) 585 (1
360
225) 360 (1
225
135) 225 (1
135
90) 135 (1
90
45) 90 (2
90
×

$\therefore$ Maximum number of animals in each flock = 45
Required total number of flocks

$$= \frac{945}{45} + \frac{2475}{45} = 21 + 55 = 76$$

14. (2) Maximum quantity in each can
= HCF of 21, 42 and 63 litres
= 21 litres
Required least number of cans

$$= \frac{21}{21} + \frac{42}{21} + \frac{63}{21}$$

= 1 + 2 + 3 = 6

15. (3) Using Rule 7,
Required number = HCF of 411 – 3 = 408; 684 – 4 = 680 and 821 – 5 = 816
HCF of 408 and 816 = 408
HCF of 408 and 680

408) 680 (1
408
272) 408 (1
272
136) 272 (2
272
×

$\therefore$ Required number = 136

16. (4) Required number = HCF of 200 and 320 = 40

Illustration :

200) 320 (1
200
120) 200 (1
120
80) 120 (1
80
40) 80 (2
80
×

17. (3) As the height of each stack is same, the required number of books in each stack
= HCF of 84, 90 and 120
84 = 2 × 2 × 3 × 7
90 = 2 × 3 × 3 × 5
120 = 2 × 2 × 2 × 3 × 5
$\therefore$ HCF = 2 × 3 = 6

18. (2) Using Rule 7,
Required number
= HCF of (729 – 9)
= 720 and (901 – 5)
= 896

720) 896 (1
720
176) 720 (4
704
16) 176 (11
16
16
16
×

H.C.F = 16

19. (1) Greatest capacity of measuring vessel
= HCF of 403 litres, 434 litres and 465 litres
= 31 litres

Illustration :

HCF of 403 and 434

403) 434 (1
403
31) 403 (13
31
93
93
×

HCF of 31 and 465

31) 465 (15
31
155
155
×

$\Rightarrow$ 31 litres

20. (3) Minimum number of rows = Maximum number of fruits in each row
$\therefore$ HCF of 24, 36 and 60 = 12
$\therefore$ Minimum number of rows

$$= \frac{24}{12} + \frac{36}{12} + \frac{60}{12}$$

= 2 + 3 + 5 = 10

21. (4) Using Rule 7,
Required number
= HCF of 2300 – 32 = 2268 and 3500 – 56 = 3444

```
2268)3444(1
     2268
     1176)2268(1
          1176
          1092)1176(1
               1092
                 84)1092(13
                     84
                     252
                     252
                      ×
```

∴ HCF = 84

22. (3) HCF of numbers = 12
Let the numbers be $12x$ and $12y$ where x and y are co–prime.
According to the question,
$12x \times 12y = 2160$
$\Rightarrow xy = \frac{2160}{12 \times 12} = 15$
= 3 × 5 or 1 × 15
∴ Required numbers
= 12 × 3 = 36 and 12 × 5 = 60

23. (2) Required number = HCF of 390, 495 and 300 = 15
Illustration :

```
390) 495 (1
     390
     105) 390 (3
          315
           75) 105 (1
                75
                30) 75 (1
                    60
                    15) 30 (2
                        30
                         ×
```

HCF of 15 and 300 = 15

24. (4) First of all we find HCF of 391 and 323.

```
323) 391 (1
     323
      68) 323 (4
          272
           51) 68 (1
               51
               17) 51 (3
                   51
                    ×
```

∴ Number of classes = 17

25. (3) Maximum length of each piece = HCF of 1.5 metre and 1.2 metre = 0.3 metre
Illustration :

```
12 ) 15 ( 1
     12
      3) 12 (4
         12
          ×
```

∴ HCF of 1.5 and 1.2 metre = 0.3 metre

TYPE-IV

1. (1) L.C.M. of 28 and 42

2	28, 42
2	14, 21
7	7, 21
	1, 3

= 2 × 2 × 7 × 3 = 84
H.C. F. of 28 and 42

```
28)42(1
   28
   14)28(2
      28
      00
```

∴ H.C. F = 14

Required ratio $= \frac{84}{14} = 6:1$

2. (3) Let the two numbers are 2x and 3x respectively.
According to question,
LCM = 54
$x(3 \times 2) = 54$
$\Rightarrow$ x = 9
Numbers = 2x = 2 × 9 = 18
and, 3x = 3 × 9 = 27
Sum of the two numbers
= 18 + 27 = 45

3. (3) Suppose the numbers are 4x and 5x respectively
According to question
x × 4 × 5 = 120
$\Rightarrow$ x = 6
∴ Required numbers
= 4 × 6 = 24
and = 5 × 6 = 30

4. (1) Let the numbers be $2x$, $3x$ and $4x$ respectively.
∴ HCF = x = 12
∴ Numbers are : 2 ×12 = 24
3 ×12 = 36, 4 ×12 = 48
LCM of 24, 36, 48
= 2 × 2 × 2 × 3 × 3 × 2 = 144

5. (3) Let the number be $3x$ and $4x$.
Their LCM = $12x$
According to the question,
$12x = 240$
$\Rightarrow x = \frac{240}{12} = 20$
∴ Smaller number = $3x$ = 3 × 20
= 60

6. (3) Let the numbers be $3x$ and $4x$.
∴ Their LCM = $12x$
∴ $12x = 84$
$\Rightarrow x = \frac{84}{12} = 7$
∴ Larger number
= $4x$ = 4 × 7 = 28

7. (1) Numbers = $3x$ and $4x$
HCF = x = 4
∴ LCM = $12x$ = 12 × 4 = 48

8. (3) Let the numbers be $4x$ and $4y$ where x and y are prime to each other.
LCM = $4xy$
$\therefore \frac{(4x+4y)}{4xy} = \frac{7}{12}$
$\Rightarrow 12(x + y) = 7xy$
$\Rightarrow x = 3, y = 4$
∴ Smaller number
= 4 × 3 = 12

9. (4) Using Rule 1,
Let the numbers be $3x$ and $4x$ respectively
First number × second number
= HCF × LCM
$\Rightarrow 3x \times 4x = 2028$
$\Rightarrow x^2 = \frac{2028}{3 \times 4} = 169$
$\therefore x = \sqrt{169} = 13$
∴ Sum of the numbers
= $3x + 4x = 7x$ = 7 × 13 = 91

10. (3) If the numbers be $2x$ and $3x$, then LCM = $6x$
∴ $6x = 48 \Rightarrow x = 8$
∴ Required sum = $2x + 3x = 5x$
= 5 × 8 = 40

11. (4) Let the numbers be $4x$ and $5x$.
∴ H.C.F. = x = 8
∴ Numbers = 32 and 40
∴ Their LCM = 160

12. (2) If the numbers be $3x$ and $4x$, then
HCF = x = 5
∴ Numbers = 15 and 20
∴ LCM = 60

13. (1) Numbers = x, $2x$ and $3x$ (let)
Their H.C.F. = x = 12
∴ Numbers = 12, 24 and 36

14. (4) Using Rule 1,

Product of two numbers

= HCF × LCM

$\Rightarrow$ Numbers = zx and zy

$\therefore$ $zx \times zy = z \times$ LCM

$\Rightarrow$ LCM = xyz

15. (4) HCF of numbers = 21

$\therefore$ Numbers = $21x$ and $21y$ Where x and y are prime to each other.

Ratio of numbers = 1 : 4

$\therefore$ Larger number = 21 × 4 = 84

TYPE-V

1. (4) Using Rule 1,

Let the numbers be x and $(x + 2)$.

$\therefore$ Product of numbers

= HCF × LCM

$\Rightarrow x(x+2) = 24$

$\Rightarrow x^2 + 2x - 24 = 0$

$\Rightarrow x^2 + 6x - 4x - 24 = 0$

$\Rightarrow x(x+6) - 4(x+6) = 0$

$\Rightarrow (x-4)(x+6) = 0$

$\Rightarrow x = 4$, as $x \neq -6 = 0$

$\therefore$ Numbers are 4 and 6.

2. (1) Using Rule 1,

Suppose 1st number is x then, 2nd number

= $100 - x$

$\therefore$ LCM × HCF = 1st number × 2nd number

$\Rightarrow 495 \times 5 = x \times (100 - x)$

$\Rightarrow 495 \times 5 = 100x - x^2$

$\Rightarrow x^2 - 55x - 45x - 2475 = 0$

$\Rightarrow (x - 45)(x - 55) = 0$

$\Rightarrow x = 45$ or $x = 55$

Then, difference = 55 – 45 = 10

3. (2) Let the number be 29x and 29y respectively

where x and y are prime to each other.

$\therefore$ LCM of 29x and 29y = 29xy

Now, 29xy = 4147

$$\therefore xy = \frac{4147}{29} = 143$$

Thus xy = 11 × 13

$\therefore$ Numbers are 29 × 11

= 319 and 29 × 13 = 377

$\therefore$ Required sum

= 377 + 319 = 696

4. (4) Let HCF be h and LCM be l.

Then, $l = 84h$ and $l + h = 680$

$\Rightarrow 84h + h = 680$

$$\Rightarrow h = \frac{680}{85} = 8$$

$\therefore$ $l = 680 - 8 = 672$

$\therefore$ Other number

$$= \frac{672 \times 8}{56} = 96$$

5. (2) HCF = 12

$\therefore$ Numbers = $12x$ and $12y$ where x and y are prime to each other.

$\therefore$ $12x + 12y = 84$

$\Rightarrow 12(x + y) = 84$

$$\Rightarrow x + y = \frac{84}{12} = 7$$

$\therefore$ Possible pairs of numbers satisfying this condition

= (1,6), (2,5) and (3,4). Hence three pairs are of required numbers.

6. (3) Let the numbers be $21x$ and $21y$ where x and y are prime to each other.

$\therefore$ $21x + 21y = 336$

$\Rightarrow 21(x + y) = 336$

$$\Rightarrow x + y = \frac{336}{21} = 16$$

$\therefore$ Possible pairs

= (1, 15), (5, 11), (7, 9), (3, 13)

7. (3) Let the number be x and y.

According to the question,

$\therefore$ $x + y = 45$ .... (i)

Again, $x - y = \frac{1}{9}(x + y)$

or $x - y = \frac{1}{9} \times 45$

or $x - y = 5$ ..... (ii)

By (i) + (ii) we have,

$x + y = 45$

$\underline{x - y = 5}$

$2x = 50$

or, $x = 25$

$\therefore$ $y = 45 - 25 = 20$.

Now, LCM of 25 and 20 = 100.

8. (3) Let the numbers be $17x$ and $17y$ where x and y are co-prime.

LCM of $17x$ and $17y$ = $17xy$

According to the question,

$17xy = 714$

$$\Rightarrow xy = \frac{714}{17} = 42 = 6 \times 7$$

$\Rightarrow x = 6$ and $y = 7$

or, $x = 7$ and $y = 6$.

$\therefore$ First number = $17x$

= 17 × 6 = 102

Second number = $17y$

= 17 × 7 = 119

$\therefore$ Sum of the numbers

= 102 + 119 = 221

9. (3) Using Rule 1,

Let the larger number be x.

$\therefore$ Smaller number = $x - 2$

$\therefore$ First number × Second number = HCF × LCM

$\Rightarrow x(x - 2) = 24$

$\Rightarrow x^2 - 2x - 24 = 0$

$\Rightarrow x^2 - 6x + 4x - 24 = 0$

$\Rightarrow x(x - 6) + 4(x - 6) = 0$

$\Rightarrow (x - 6)(x + 4) = 0$

$\Rightarrow x = 6$ because $x \neq -4$

10. (2) HCF of two numbers = 27

$\therefore$ Let the numbers be $27x$ and $27y$ where x and y are prime to each other.

According to the question,

$27x + 27y = 216$

$\Rightarrow 27(x + y) = 216$

$$\Rightarrow x + y = \frac{216}{27} = 8$$

$\therefore$ Possible pairs of x and y = (1, 7) and (3, 5)

$\therefore$ Numbers =(27, 189) and (81, 135)

11. (1) Using Rule 1,

Let the HCF of numbers = H

$\therefore$ Their LCM = 12H

According to the question,

12H + H = 403

$\Rightarrow$13H = 403

$$\Rightarrow H = \frac{403}{13} = 31$$

$\Rightarrow$ LCM = 12 × 31

Now,

First number × second number

= HCF × LCM

= 93 × Second Number

= 31 × 31 × 12

$$\text{Second number} = \frac{31 \times 31 \times 12}{93}$$

= 124

12. (3) Let the numbers be $48x$ and $48y$ where x and y are co-primes.

$\therefore$ $48x + 48y = 384$

$\Rightarrow$ $48(x + y) = 384$

$\Rightarrow$ $x + y = \frac{384}{48} = 8$ .... (i)

Possible and acceptable pairs of x and y satisfying this condition are : (1, 7) and (3, 5).

$\therefore$ Numbers are : $48 \times 1 = 48$ and $48 \times 7 = 336$

and $48 \times 3 = 144$ and $48 \times 5 = 240$

$\therefore$ Required difference

$= 336 - 48 = 288$

13. (3) Let the numbers be $3x$ and $3y$.

$\therefore 3x + 3y = 36$

$\Rightarrow x + y = 12$ ... (i)

and $3xy = 105$ ... (ii)

Dividing equation (i) by (ii), we have

$\frac{x}{3xy} + \frac{y}{3xy} = \frac{12}{105}$

$\Rightarrow \frac{1}{3y} + \frac{1}{3x} = \frac{4}{35}$

14. (4) Let the numbers be $10x$ and $10y$ where x and y are prime to each other.

$\therefore$ LCM = $10\,xy$

$\Rightarrow 10xy = 120$

$\Rightarrow xy = 12$

Possible pairs = (3, 4) or (1, 12)

$\therefore$ Sum of the numbers $= 30 + 40 = 70$

15. (3) Let the numbers be x, y and z which are prime to one another.

Now, $xy = 551$

$yz = 1073$

$\therefore$ y = HCF of 551 and 1073

$\therefore$ $y = 29$

$\therefore$ $x = \frac{551}{29} = 19$

and $z = \frac{1073}{29} = 37$

$\therefore$ Sum $= 19 + 29 + 37 = 85$

16. (3) HCF of two numbers = 4.

Hence, the numbers can be given by $4x$ and $4y$ where x and y are co-prime. Then,

$4x + 4y = 36 \Rightarrow 4(x + y) = 36$

$\Rightarrow x + y = 9$

Possible pairs satisfying this condition are : (1, 8), (4, 5), (2, 7)

17. (2) Let the numbers be $2x$ and $2y$ where x and y are prime to each other.

$\therefore$ LCM = $2xy$

$\Rightarrow 2xy = 84$

$\Rightarrow xy = 42 = 6 \times 7$

$\therefore$ Numbers are 12 and 14.

Hence Sum = 12 + 14 = 26

18. (3) Let the numbers be xH and yH where H is the HCF and $y\text{H} > x\text{H}$.

$\therefore$ LCM = xy H

$\therefore xy\text{H} = 2y\text{H} \Rightarrow x = 2$

Again, $x\text{H} - \text{H} = 4$

$\Rightarrow 2\text{H} - \text{H} = 4 \Rightarrow \text{H} = 4$

$\therefore$ Smaller number = $x\text{H} = 8$

19. (4) Using Rule 1,

Let the H.C.F. be H.

$\therefore$ L.C.M. = 20H

Then, H + 20H = 2520

$\Rightarrow$ 21 H = 2520

$\Rightarrow \text{H} = \frac{2520}{21} = 120$

$\therefore$ L.C.M. = 20H = $20 \times 120 = 2400$

As,

First number $\times$ Second number = L.C.M. $\times$ H.C.F.

$\Rightarrow$ 480 $\times$ Second number $= 2400 \times 120$

$\Rightarrow$ Second number

$= \frac{2400 \times 120}{480} = 600$

20. (1) Using Rule 1,

If the HCF = H, then

LCM = 44 H

$\therefore$ 44 H + H = 1125

$\Rightarrow$ 45 H = 1125

$\therefore$ $\text{H} = \frac{1125}{45} = 25$

$\therefore$ LCM $= 44 \times 25 = 1100$

Now

First number $\times$ Second number = LCM $\times$ HCF

$\Rightarrow$ $25 \times$ Second number $= 1100 \times 25$

$\therefore$ Second number

$= \frac{1100 \times 25}{25} = 1100$

21. (4) Let no. are x and y and HCF = A, LCM = B

Using Rule, we have

xy = AB

$\Rightarrow x + y = \text{A} + \text{B}$ (given) ...(i)

$(x-y)^2 = (x + y)^2 - 4xy$

or, $(x-y)^2 = (\text{A} + \text{B})^2 - 4\,\text{AB}$

or, $(x-y)^2 = (\text{A} - \text{B})^2$

or, $(x-y) = \text{A} - \text{B}$ ...(ii)

Using (i) and (ii), we get

$x = \text{A}$ and $y = \text{B}$

$\therefore \text{A}^3 + \text{B}^3 = x^3 + y^3$

22. (3) Let the numbers be $7x$ and $7y$ where x and y are co-prime.

Now, LCM of $7x$ and $7y = 7xy$

$\therefore$ $7xy = 140$

$\Rightarrow xy = \frac{140}{7} = 20$

Now, required values of x and y whose product is 50 and are co-prime, will be 4 and 5.

$\therefore$ Numbers are 28 and 35 which lie between 20 and 45.

$\therefore$ Required sum = 28 + 35 = 63.

23. (4) Firstly, we find the LCM of 30, 36 and 80.

2	30, 36, 80
2	15, 18, 40
3	15, 9, 20
5	5, 3, 20
	1, 3, 4

$\therefore$ LCM $= 2 \times 2 \times 3 \times 5 \times 3 \times 4 = 720$

$\therefore$ Required number = Multiple of 720 = $720 \times 5 = 3600$; because $3000 < 3600 < 4000$

24. (3) LCM of 5, 6, 7 and 8 = 840

2	5,	6,	7,	8
	5,	3,	7,	4

$\therefore$ LCM $= 2 \times 5 \times 3 \times 7 \times 4 = 840$

$\therefore$ Required number = $840x + 3$ which is divisible by 9 for a certain least value of x.

Now,

$840x + 3 = 93x \times 9 + 3x + 3$

$3x + 3$, is divisible by 9 for $x = 2$

$\therefore$ Required number $= 840 \times 2 + 3$

$= 1680 + 3 = 1683$

$\therefore$ Sum of digits $= 1 + 6 + 8 + 3 = 18$

25. (1) Using Rule 1,

2	12,	18,	21,	28
2	6,	9,	21,	14
3	3,	9,	21,	7
7	1,	3,	7,	7
	1,	3,	1,	1

$\therefore$ LCM = $2 \times 2 \times 3 \times 3 \times 7 = 252$
The largest 4-digit number
= 9999

$$\begin{array}{r} 252)\ 9999\ (39 \\ 756 \\ \hline 2439 \\ 2268 \\ \hline 171 \end{array}$$

$\therefore$ Required number
= 9999 – 171 = 9828

26. (4) LCM of 8, 12 and 16 = 48
$\therefore$ Required number
= $48a + 3$ which is divisible by 7.
$\therefore$ $x = 48a + 3$
= $(7 \times 6a) + (6a + 3)$ which is divisible by 7.
i.e. $6a + 3$ is divisible by 7.
When $a = 3$, $6a + 3 = 18 + 3$
= 21 which is divisible by 7.
$\therefore$ $x = 48 \times 3 + 3 = 144 + 3 = 147$

27. (1)

$$\begin{array}{c|cccc} 2 & 12, & 16, & 18, & 21 \\ \hline 2 & 6, & 8, & 9, & 21 \\ \hline 3 & 3, & 4, & 9, & 21 \\ \hline & 1, & 4, & 3, & 7 \end{array}$$

$\therefore$ LCM = $2 \times 2 \times 3 \times 4 \times 3 \times 7$
= 1008
Multiple of 1008 = 2016
$\therefore$ Required number
= 2016 – 2000 = 16 = x
$\therefore$ Sum of digits of $x = 1 + 6 = 7$

28. (3)

$$\begin{array}{c|ccc} 2 & 12, & 18, & 21 \\ \hline 3 & 6, & 9, & 21 \\ \hline & 2, & 3, & 7 \end{array}$$

$\therefore$ LCM of 12, 18 and 21
= $2 \times 3 \times 2 \times 3 \times 7 = 252$
Of the options,
$10080 \div 252 = 40$

29. (1)We find LCM of 30, 36 and 80.

$$\begin{array}{c|ccc} 2 & 30, & 36, & 80 \\ \hline 2 & 15, & 18, & 40 \\ \hline 3 & 15, & 9, & 20 \\ \hline 5 & 5, & 3, & 20 \\ \hline & 1, & 3, & 4 \end{array}$$

$\therefore$ LCM = $2 \times 2 \times 3 \times 3 \times 4 \times 5$
= 720
$\therefore$ Required number
= $2 \times 720 + 11$
= 1440 + 11 = 1451

30. (2)

$$\begin{array}{c|cccc} 2 & 12, & 18, & 21, & 32 \\ \hline 2 & 6, & 9, & 21, & 16 \\ \hline 3 & 3, & 9, & 21, & 8 \\ \hline & 1, & 3, & 7, & 8 \end{array}$$

$\therefore$ LCM = $2 \times 2 \times 3 \times 3 \times 7 \times 8$
= 2016
$\therefore$ Required number
= $2016 \times 2 = 4032$

31. (4)

$$\begin{array}{c|c} 2 & 210 \\ \hline 3 & 105 \\ \hline 5 & 35 \\ \hline & 7 \end{array}$$

$\therefore$ $210 = 2 \times 3 \times 5 \times 7 = 5 \times 6 \times 7$
$\therefore$ Required answer = 5 + 6 = 11

TYPE-VI

1. (3) Let the numbers be $12x$ and $12y$.
$\therefore$ Their LCM = $12xy$ when x and y are prime to each other.
$\therefore$ $y = \frac{1056}{132} = 8$ [$\because$ $12x = 132$]
$\therefore$ Other number = $12y$
= $12 \times 8 = 96$

2. (2) When 36798 is divided by 78, remainder = 60
$\therefore$ The least number to be subtracted = 60

3. (1) LCM of 18, 21 and 24

$$\begin{array}{c|ccc} 2 & 18, & 21, & 24 \\ \hline 3 & 9, & 21, & 12 \\ \hline & 3, & 7, & 4 \end{array}$$

LCM = $2 \times 3 \times 3 \times 7 \times 4 = 504$
Now compare the divisors with their respective remainders. We observe that in all the cases the remainder is just 11 less than their respective divisor. So the number can be given by 504 K – 11. Where K is a positive integer
Since $23 \times 21 = 483$
We can write 504 K – 11
= (483 + 21) K – 11
= 483 K + (21K – 11)
483 K is multiple of 23, since 483 is divisible by 23.
So, for (504K – 11) to be multiple of 23, the remainder (21K – 11) must be divisible by 23.
Put the value of K = 1, 2, 3, 4, 5, 6, ... and so on successively. We find that the minimum value of K for which (21K – 11) is divisible by 23. is 6, $(21 \times 6 - 11)$ = 115 which is divisible by 23.
Therefore, the required least number
= $504 \times 6 - 11 = 3013$

4. (4) Using Rule 7,
Clearly, 122 – 2 = 120 and 243 – 3 = 240 are exactly divisible by the required number.
$\therefore$ Required number
= HCF of 120 and 240 = 120

5. (2) $P = 2^3 \times 3^{10} \times 5$
$Q = 2^5 \times 3 \times 7$
HCF = $2^3 \times 3$

6. (4) Let the original fraction be $\frac{x}{y}$.

$\therefore$ $\frac{x-4}{y+1} = \frac{1}{6}$

$\Rightarrow$ $6x - 24 = y + 1$
$\Rightarrow$ $6x - y = 25$ ....(i)
Again,

$\frac{x+2}{y+1} = \frac{1}{3}$

$\Rightarrow$ $3x + 6 = y + 1$
$\Rightarrow$ $3x - y = -5$ ....(ii)
By equation (i) – (ii),
$6x - y - 3x + y = 25 + 5$
$\Rightarrow$ $3x = 30$ $\Rightarrow x = 10$
From equation (i),
$60 - y = 25 \Rightarrow y = 35$
LCM of 10 and 35 = 70

7. (4) HCF of a and b = 12
$\therefore$ Numbers = $12x$ and $12y$
where x and y are prime to each other.
$\because$ $a > b > 12$
$\therefore$ $a = 36$; $b = 24$

8. (4) Let the numbers be $9x$ and $9y$ where x and y are prime to each other.
According to the question,
$9x + 9y = 99$
$\Rightarrow 9(x + y) = 99$
$\Rightarrow x + y = 11$
Possible pairs = (1, 10) (2, 9), (3, 8), (4, 7), (5, 6)