LCM AND HCF

Importance : Questions based on L.C.M and H.C.F concepts (in addition involved in other questions) are independently asked in certain competitive exams. A little practice with full 'concentration' will enable you to learn how to solve these questions.

Scope of questions : Most asked questions are related to finding out L.C.M. or H.C.F. for numbers special questions are based on remainder on dividing. difference ratio of L.C.M./H.C.F. to make complete square/cube of different number etc.

Way to success : TRICKS in addition to formulae help in most of L.C.M. & H.C.F. questions.

IMPORTANT DEFINITIONS :

Highest Common Factor (H.C.F) : It is also called Greatest common Diviser (G.C.D). When a greatest number divides perfectly the two or more given numbers then that number is called the H.C.F. of two or more given numbers. e.g.

The H.C.F of 10, 20, 30 is 10 as they are perfectly divided by 10,5 and 2 and 10 is highest or greatest of them.

Least common Multiple (L.C.M.) : The least number which is divisible by two or more given numbers, that least number is called L.C.M. of the numbers.

L.C.M. of 3,5,6 is 30, because all 3 numbers divide 30, 60, 90, ... and so on perfectly and 30 is minimum of them.

Factor and Multiple : If a number m, divides perfectly second number n, then m is called the factor of n and n is called the multiple of m.

Rule 1 : 1st number × 2nd number = L.C. M. × H.C.F.

- **There are two methods for calculating the H.C.F and L.C.M.**

  (i) Factor Method

  (ii) Division Method

- **If the ratio of two numbers is a:b, (lowest form i.e. indivisible to each other) then**

Numbers are ak and bk, where k is a constant and hence,

H.C.F. is K and L.C.M. is abk.

Rule 2 : L.C.M of fractions

$$= \frac{\text{L.C.M. of numerators}}{\text{H.C.F. of denominators}}$$

Rule 3 : H.C.F. of fractions

$$= \frac{\text{H.C.F of numerators}}{\text{L.C.M. of denominators}}$$

IMPORTANT POINTS

- If there is no common factor between two numbers, then L.C.M. will be the product of both numbers.
- If there are 'n' numbers in a set and H.C.F. of any two numbers is H and L.C.M. of all 'n' numbers is L, then product of all 'n' numbers is $\left[(H)^{n-1} \times L\right]$

Rule 4 : When a number is divided by a, b or c leaving same remainder 'r' in each case then that number must be k + r where k is LCM of a, b and c.

Rule 5 : When a number is divided by a, b or c leaving remainders p, q or r respectively such that the difference between divisor and remainder in each case is same i.e., (a – P) = (b – q) = (c – r) = t (say) then that (least) number must be in the form of (k – t), where k is LCM of a, b and c

Rule 6 : The largest number which when divide the numbers a, b and c the remainders are same then that largest number is given by H.C.F. of (a – b), (b – c) and (c – a).

Rule 7 : The largest number which when divide the numbers a, b and c give remainders as p, q, r respectively is given by H.C.F. of (a – p), (b – q) and (c – r).

Rule 8 : Greatest n digit number which when divided by three numbers p,q,r leaves no remainder will be

Required Number = (n – digit greatest number) – R

R is the remainder obtained on dividing greatest n digit number by L.C.M of p.q,r.

Rule 9 : The n digit largest number which when divided by p, q, r leaves remainder 'a' will be

Required number = [n – digit largest number – R] + a

where, R is the remainder obtained when

n – digit largest number is divided by the L.C.M of p, q, r.

❑❑❑

QUESTIONS ASKED IN PREVIOUS SSC EXAMS

TYPE–I

1. The LCM of two numbers is 864 and their HCF is 144. If one of the number is 288, the other number is :
(1) 576 (2) 1296
(3) 432 (4) 144
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

2. LCM of two numbers is 225 and their HCF is 5. If one number is 25, the other number will be:
(1) 5 (2) 25
(3) 45 (4) 225
(SSC CGL Prelim Exam. 04.07.1999 (Second Sitting)

3. The L.C.M. of two numbers is 1820 and their H.C.F. is 26. If one number is 130 then the other number is :
(1) 70 (2) 1690
(3) 364 (4) 1264
(SSC CGL Prelim Exam. 24.02.2002 (First Sitting)

4. The LCM of two numbers is 1920 and their HCF is 16. If one of the number is 128, find the other number.
(1) 204 (2) 240
(3) 260 (4) 320
(SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

5. The HCF of two numbers 12906 and 14818 is 478. Their LCM is
(1) 400086 (2) 200043
(3) 600129 (4) 800172
(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

6. The H.C.F. and L.C.M. of two 2-digit numbers are 16 and 480 respectively. The numbers are :
(1) 40, 48 (2) 60, 72
(3) 64, 80 (4) 80, 96
(SSC CPO S.I. Exam. 26.05.2005)

7. The HCF of two numbers is 16 and their LCM is 160. If one of the number is 32, then the other number is
(1) 48 (2) 80
(3) 96 (4) 112
(SSC CPO Sub Inspector Exam. 12.01.2003

8. The product of two numbers is 4107. If the H.C.F. of the numbers is 37, the greater number is
(1) 185 (2) 111
(3) 107 (4) 101
(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting) & SSC CGL Exam. 27.07.08 (Second Sitting)

9. The HCF of two numbers is 15 and their LCM is 300. If one of the number is 60, the other is :
(1) 50 (2) 75
(3) 65 (4) 100
(SSC CGL Prelim Exam. 08.02.2004 (First Sitting)

10. The HCF and LCM of two numbers are 12 and 924 respectively. Then the number of such pairs is
(1) 0 (2) 1
(3) 2 (4) 3
(SSC CGLTier-1 Exam 26.06.2011 (Second Sitting)

11. The LCM of two numbers is 30 and their HCF is 5. One of the number is 10. The other is
(1) 20 (2) 25
(3) 15 (4) 5
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

12. The product of two numbers is 1280 and their H.C.F. is 8. The L.C.M. of the number will be :
(1) 160 (2) 150
(3) 120 (4) 140
(SSC CPO SI Exam. 16.12.2007)

13. The H.C.F. and L.C.M. of two numbers are 8 and 48 respectively. If one of the number is 24, then the other number is
(1) 48 (2) 36
(3) 24 (4) 16
(SSC CGLTier-I Exam. 16.05.2010 (First Sitting)

14. The H.C.F and L.C.M of two numbers are 12 and 336 respectively. If one of the number is 84, the other is
(1) 36 (2) 48
(3) 72 (4) 96
(SSC CGLTier-I Exam. 16.05.2010 (Second Sitting)

15. The product of two numbers is 216. If the HCF is 6, then their LCM is
(1) 72 (2) 60
(3) 48 (4) 36
(SSC CISF ASI Exam 29.08.2010 (Paper-1)

16. The HCF and LCM of two numbers are 18 and 378 respectively. If one of the number is 54, then the other number is
(1) 126 (2) 144
(3) 198 (4) 238
(SSC (South Zone) Investigator Exam 12.09.2010)

17. The HCF and product of two numbers are 15 and 6300 respectively. The number of possible pairs of the numbers is
(1) 4 (2) 3
(3) 2 (4) 1
(SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

18. The HCF of two numbers is 15 and their LCM is 225. If one of the number is 75, then the other number is :
(1) 105 (2) 90
(3) 60 (4) 45
(SSC CHSL DEO & LDC Exam. 27.11.2010)

19. The LCM of two numbers is 520 and their HCF is 4. If one of the number is 52, then the other number is
(1) 40 (2) 42
(3) 50 (4) 52
(SSC CISF Constable (GD) Exam. 05.06.2011)

20. The H.C.F. of two numbers is 96 and their L.C.M. is 1296. If one of the number is 864, the other is
(1) 132 (2) 135
(3) 140 (4) 144
(SSC CHSL DEO & LDC Exam. 04.12.2011 (IInd Sitting (East Zone)

21. The LCM of two numbers is 4 times their HCF. The sum of LCM and HCF is 125. If one of the number is 100, then the other number is
(1) 5 (2) 25
(3) 100 (4) 125
(SSC Multi-Tasking (Non-Technical) Staff Exam. 20.02.2011)

22. Product of two co-prime numbers is 117. Then their L.C.M. is
(1) 117 (2) 9
(3) 13 (4) 39
(SSC CGL Tier-I Exam. 19.05.2013 Ist Sitting)

23. The product of two numbers is 2160 and their HCF is 12. Number of such possible pairs is
(1) 1 (2) 2
(3) 3 (4) 4
(SSC CHSL DEO & LDC Exam. 27.10.2013 IInd Sitting)

24. LCM of two numbers is 2079 and their HCF is 27. If one of the number is 189, the other number is
(1) 297 (2) 584
(3) 189 (4) 216
(SSC (10+2) Level Data Entry Operator & LDC Exam. 10.11.2013, IInd Sitting)

25. The product of two numbers is 2028 and their HCF is 13. The number of such pairs is
(1) 1 (2) 2
(3) 3 (4) 4
(SSC CPO S.I. Exam. 12.01.2003 & SSC CGL Tier-I Exam. 19.06.11 (First Sitting)

26. The HCF and LCM of two numbers are 13 and 455 respectively. If one of the number lies between 75 and 125, then, that number is :
(1) 78 (2) 91
(3) 104 (4) 117
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

27. The H.C.F. of two numbers is 8. Which one of the following can never be their L.C.M.?
(1) 24 (2) 48
(3) 56 (4) 60
(SSC CGL Prelim Exam. 27.02.2000 (First Sitting)

28. The HCF of two numbers is 23 and the other two factors of their LCM are 13 and 14. The larger of the two numbers is :
(1) 276 (2) 299
(3) 345 (4) 322
(SSC CGL Prelim Exam. 08.02.2004 (First Sitting)

29. The L.C.M. of three different numbers is 120. Which of the following cannot be their H.C.F.?
(1) 8 (2) 12
(3) 24 (4) 35
(SSC CGL Tier-1 Exam 26.06.2011 (First Sitting)

30. The H.C.F. and L.C.M. of two numbers are 44 and 264 respectively. If the first number is divided by 2, the quotient is 44. The other number is
(1) 147 (2) 528
(3) 132 (4) 264
(SSC CHSL DEO & LDC Exam. 9.11.2014

TYPE–II

1. The least number which when divided by 4, 6, 8, 12 and 16 leaves a remainder of 2 in each case is :
(1) 46 (2) 48
(3) 50 (4) 56
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

2. The least number, which when divided by 12, 15, 20 or 54 leaves a remainder of 4 in each case, is :
(1) 450 (2) 454
(3) 540 (4) 544
(SSC CGL Prelim Exam. 04.07.1999 (Second Sitting)

3. Find the greatest number of five digits which when divided by 3, 5, 8, 12 have 2 as remainder :
(1) 99999 (2) 99958
(3) 99960 (4) 99962
(SSC CGL Prelim Exam. 24.02.2002 (First Sitting)

4. The least multiple of 13, which on dividing by 4, 5, 6, 7 and 8 leaves remainder 2 in each case is:
(1) 2520 (2) 842
(3) 2522 (4) 840
(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone, SSC CGL Prelim Exam. 24.02.2002 (Second Sitting) & SSC CGL Prelim Exam. 13.11.2005)

5. A, B, C start running at the same time and at the same point in the same direction in a circular stadium. A completes a round in 252 seconds, B in 308 seconds and C in 198 seconds. After what time will they meet again at the starting point ?
(1) 26 minutes 18 seconds
(2) 42 minutes 36 seconds
(3) 45 minutes
(4) 46 minutes 12 seconds
(SSC Constable (GD) & Rifleman (GD) Exam. 22.04.2012 (Ist Sitting)

6. Find the largest number of four digits such that on dividing by 15, 18, 21 and 24 the remainders are 11, 14, 17 and 20 respectively.
(1) 6557 (2) 7556
(3) 5675 (4) 7664
(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

7. The least perfect square, which is divisible by each of 21, 36 and 66 is
(1) 214344 (2) 214434
(3) 213444 (4) 231444
(SSC CPO S.I. Exam. 12.01.2003)

8. The least number, which when divided by 4, 5 and 6 leaves remainder 1, 2 and 3 respectively, is
(1) 57 (2) 59
(3) 61 (4) 63
(SSC CPO S.I. Exam. 12.01.2003)

9. Let the least number of six digits which when divided by 4, 6, 10, 15 leaves in each case same remainder 2 be N. The sum of digits in N is :
(1) 3 (2) 5
(3) 4 (4) 6
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

10. Which is the least number which when doubled will be exactly divisible by 12, 18, 21 and 30 ?
(1) 2520 (2) 1260
(3) 630 (4) 196
(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

11. The smallest square number divisible by 10, 16 and 24 is
(1) 900 (2) 1600
(3) 2500 (4) 3600
(SSC CPO S.I. Exam. 07.09.2003)

12. If the students of a class can be grouped exactly into 6 or 8 or 10, then the minimum number of students in the class must be
(1) 60 (2) 120
(3) 180 (4) 240
(SSC CGL Prelim Exam. 08.02.2004 (First Sitting)

13. The least number which when divided by 4, 6, 8 and 9 leave zero remainder in each case and when divided by 13 leaves a remainder of 7 is :
(1) 144 (2) 72
(3) 36 (4) 85
(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

14. The smallest number, which when divided by 12 and 16 leaves remainder 5 and 9 respectively, is :
(1) 55 (2) 41
(3) 39 (4) 29
(SSC CPO S.I. Exam. 26.05.2005)

15. A number which when divided by 10 leaves a remainder of 9, when divided by 9 leaves a remainder of 8, and when divided by 8 leaves a remainder of 7, is :
(1) 1539 (2) 539
(3) 359 (4) 1359
(SSC CPO S.I. Exam. 26.05.2005)

16. What is the smallest number which leaves remainder 3 when divided by any of the numbers 5, 6 or 8 but leaves no remainder when it is divided by 9 ?
(1) 123 (2) 603
(3) 723 (4) 243
(SSC Section Officer (Commercial Audit) Exam. 25.09.2005)

17. The least number which when divided by 16, 18, 20 and 25 leaves 4 as remainder in each case but when divided by 7 leaves no remainder is
(1) 17004 (2) 18000
(3) 18002 (4) 18004
(SSC CGL DEO & LDC Exam. 04.12.2011 (Ist Sitting (East Zone)

18. What is the least number which when divided by the numbers 3, 5, 6, 8, 10 and 12 leaves in each case a remainder 2 but when divided by 13 leaves no remainder ?
(1) 312 (2) 962
(3) 1562 (4) 1586
(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting)

19. The least multiple of 7, which leaves the remainder 4, when divided by any of 6, 9, 15 and 18, is
(1) 76 (2) 94
(3) 184 (4) 364
(SSC Section Officer (Commercial Audit) Exam. 30.09.2007 (Second Sitting)

20. The largest number of five digits which, when divided by 16, 24, 30, or 36 leaves the same remainder 10 in each case, is :
(1) 99279 (2) 99370
(3) 99269 (4) 99350
(SSC CPO S.I. Exam. 16.12.2007)

21. The smallest number, which when divided by 5, 10, 12 and 15, leaves remainder 2 in each case; but when divided by 7 leaves no remainder, is
(1) 189 (2) 182
(3) 175 (3) 91
(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

22. What least number must be subtracted from 1936 so that the resulting number when divided by 9, 10 and 15 will leave in each case the same remainder 7 ?
(1) 37 (2) 36
(3) 39 (4) 30
(SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

23. The least number, which when divided by 18, 27 and 36 separately leaves remainders 5,14, and 23 respectively, is
(1) 95 (2) 113
(3) 149 (4) 77
(SSC CPO S.I. Exam. 09.11.2008)

24. The least number which when divided by 5, 6, 7 and 8 leaves a remainder 3, but when divided by 9 leaves no remainder is
(1) 1677 (2) 1683
(3) 2523 (4) 3363
(SSC CPO S.I. Exam. 06.09.2009) & SSC CGL Tier-1 Exam. 26.06.2011 (Second Sitting)

25. The greatest number of four digits which when divided by 12, 16 and 24 leave remainders 2, 6 and 14 respectively is
(1) 9974 (2) 9970
(3) 9807 (4) 9998
(SSC CPO S.I. Exam. 06.09.2009)

26. When a number is divided by 15, 20 or 35, each time the remainder is 8. Then the smallest number is
(1) 428 (2) 427
(3) 328 (4) 338
(SSC CPO S.I. Exam. 06.09.2009)

27. The smallest number, which, when divided by 12 or 10 or 8, leaves remainder 6 in each case, is
(1) 246 (2) 186
(3) 126 (4) 66
(SSC (South Zone) Investigator Exam. 12.09.2010)

28. The traffic lights at three different road crossings change after 24 seconds, 36 seconds and 54 seconds respectively. If they all change simultaneously at 10 : 15 : 00 AM, then at what time will they again change simultaneously?
(1) 10 : 16 : 54 AM
(2) 10 : 18 : 36 AM
(3) 10 : 17 : 02 AM
(4) 10 : 22 : 12 AM
(SSC CGLTier-1 Exam. 26.06.2011 (First Sitting)

29. From a point on a circular track 5 km long A, B and C started running in the same direction at the same time with speed of $2\frac{1}{2}$ km per hour, 3 km per hour and 2 km per hour respectively. Then on the starting point all three will meet again after
(1) 30 hours (2) 6 hours
(3) 10 hours (4) 15 hours
(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

30. Four runners started running simultaneously from a point on a circular track. They took 200 seconds, 300 seconds, 360 seconds and 450 seconds to complete one round. After how much time do they meet at the starting point for the first time ?
(1) 1800 seconds
(2) 3600 seconds
(3) 2400 seconds
(4) 4800 seconds
(SSC CGL Tier-1 Exam. 19.06.2011 (Second Sitting)

31. Four bells ring at intervals of 4, 6, 8 and 14 seconds. They start ringing simultaneously at 12.00 O'clock. At what time will they again ring simultaneously ?
(1) 12 hrs. 2 min. 48 sec.
(2) 12 hrs. 3 min.
(3) 12 hrs. 3 min. 20 sec.
(4) 12 hrs. 3 min. 44 sec.
(SSC CGL Prelim Exam. 04.07.1999 (Second Sitting)

32. 4 bells ring at intervals of 30 minutes, 1 hour, $1\frac{1}{2}$ hour and 1 hour 45 minutes respectively. All the bells ring simultaneously at 12 noon. They will again ring simultaneously at :
(1) 12 mid night (2) 3 a.m.
(3) 6 a.m. (4) 9 a.m.
(SSC CGL Prelim Exam. 24.02.2002 (First Sitting)

33. Four bells ring at the intervals of 5, 6, 8 and 9 seconds. All the bells ring simulataneously at some time. They will again ring simultaneously after
(1) 6 minutes (2) 12 minutes
(3) 18 minutes (4) 24 minutes
(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

34. Three bells ring simultaneously at 11a.m. They ring at regular intervals of 20 minutes, 30 minutes, 40 minutes respectively. The time when all the three ring together next is
(1) 2 p.m. (2) 1 p.m.
(3) 1.15 p.m. (4) 1.30 p.m.
(SSC CGL Tier-1 Exam. 19.06.2011 (First Sitting)

35. The greatest number of four digits which when divided by 3, 5, 7, 9 leave remainders 1, 3, 5, 7 respectively is :
(1) 9763 (2) 9764
(3) 9766 (4) 9765
(SSC CGL DEO & LDC Exam. 21.10.2012 (IInd Sitting)

36. Five bells begin to toll together and toll respectively at intervals of 6, 7, 8, 9 and 12 seconds. After how many seconds will they toll together again ?
(1) 72 Sec. (2) 612 Sec.
(3) 504 Sec. (4) 318 Sec.
(SSC Constable (GD) Exam. 12.05.2013)

37. L.C.M. of $\frac{2}{3}, \frac{4}{9}, \frac{5}{6}$ is
(1) $\frac{8}{27}$ (2) $\frac{20}{3}$
(3) $\frac{10}{3}$ (4) $\frac{20}{27}$
(SSCCGL DEO & LDC Exam. 20.10.2013)

38. The number nearest to 10000, which is exactly divisible by each of 3, 4, 5, 6, 7 and 8, is :
(1) 9240 (2) 10080
(3) 9996 (4) 10000
(SSC CGL Prelim Exam. 08.02.2004 (First Sitting)

39. The largest 4-digit number exactly divisible by each of 12, 15, 18 and 27 is
(1) 9690 (2) 9720
(3) 9930 (4) 9960
(SSC Section Officer (Commercial Audit) Exam. 26.11.2006 (Second Sitting)

40. The least number, which is a perfect square and is divisible by each of the numbers 16, 20 and 24, is
(1) 1600 (2) 3600
(3) 6400 (4) 14400
(SSC Section Officer (Commercial Audit) Exam. 30.09.2007 (Second Sitting)

41. The number nearest to 43582 divisible by each of 25, 50 and 75 is :
(1) 43500 (2) 43650
(3) 43600 (4) 43550
(SSC CPO S.I. Exam. 16.12.2007)

42. The smallest number, which when increased by 5 is divisible by each of 24,32, 36 and 564, is
(1) 869 (2) 859
(3) 4320 (4) 427
(SSC CPO S.I. Exam. 09.11.2008)

43. The greatest number, which when subtracted from 5834, gives a number exactly divisible by each of 20, 28, 32 and 35, is
(1) 1120 (2) 4714
(3) 5200 (4) 5600
(SSC CGL Tier-I Exam. 16.05.2010 (First Sitting)

44. The smallest perfect square divisible by each of 6, 12 and 18 is
(1) 196 (2) 144
(3) 108 (4) 36
(SSC (South Zone) Investigator Exam. 12.09.2010)

45. The greatest 4-digit number exactly divisible by 10, 15, 20 is
(1) 9990 (2) 9960
(3) 9980 (4) 9995
(SSC Graduate Level Tier-II Exam. 29.09.2013)

46. Find the least number which when divided separately by 15, 20, 36 and 48 leaves 3 as remainder in each case.
(1) 183 (2) 243
(3) 483 (4) 723
(SSC CGL Tier-II Exam. 21.09.2014)

47. Three men step off together from the same spot. Their steps measure 63 cm, 70 cm and 77 cm respectively. The minimum distance each should cover so that all can cover the distance in complete steps is
(1) 9630 cm (2) 9360 cm
(3) 6930 cm (4) 6950 cm
(SSC CGL Tier-II Exam. 21.09.2014)

48. Three bells ring at intervals of 36 seconds, 40 seconds and 48 seconds respectively. They start ringing together at a particular time. They will ring together after every
(1) 6 minutes (2) 12 minutes
(3) 18 minutes (4) 24 minutes
(SSC CGL Tier-II Online Exam.01.12.2016)

49. The LCM of four consecutive numbers is 60. The sum of the first two numbers is equal to the fourth number. What is the sum of four numbers?
(1) 17 (2) 14
(3) 21 (4) 24
(SSC CPO SI, ASI Online Exam.05.06.2016) (IInd Sitting)

50. The LCM fo two prime numbers x and y, $(x > y)$ is 161. The value of $(3y - x)$:
(1) –2 (2) –1
(3) 1 (4) 2
(SSC CGL Tier-I (CBE) Exam. 27.10.2016 (Ist Sitting)

51. Three electronic devices make a beep after every 48 seconds, 72 seconds and 108 seconds respectively. They beeped together at 10 a.m. The time when they will next make a beep together at the earliest is
(1) 10 : 07 : 12 hours
(2) 10 : 07 : 24 hours
(3) 10 : 07 : 36 hours
(4) 10 : 07 : 48 hours
(SSC CGL Tier-II (CBE) Exam. 12.01.2017)

TYPE–III

1. The maximum number of students among whom 1001 pens and 910 pencils can be distributed in such a way that each student gets same number of pens and same number of pencils, is :
(1) 91 (2) 910
(3) 1001 (4) 1911
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

2. The greatest number, which when divide 989 and 1327 leave remainders 5 and 7 respectively, is :
(1) 8 (2) 16
(3) 24 (4) 32
(SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

3. H.C.F of $\frac{2}{3}, \frac{4}{5}$ and $\frac{6}{7}$ is
(1) $\frac{48}{105}$ (2) $\frac{2}{105}$
(3) $\frac{1}{105}$ (4) $\frac{24}{105}$
(SSC Graduate Level Tier-II Exam. 16.09.2012)

4. Let N be the greatest number that will divide 1305, 4665 and 6905 leaving the same remainder in each case. Then, sum of the digits in N is :
(1) 4 (2) 5
(3) 6 (4) 8
(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

5. What is the greatest number that will divide 307 and 330 leaving remainders 3 and 7 respectively ?
(1) 19 (2) 16
(3) 17 (4) 23
(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting)

6. Which greatest number will divide 3026 and 5053 leaving remainders 11 and 13 respectively?
(1) 18 (2) 30
(3) 45 (4) 60
(SSC CPO S.I. Exam. 03.09.2006)

7. The greatest number, by which 1657 and 2037 are divided to give remainders 6 and 5 respectively, is
(1) 127 (2) 133
(3) 235 (4) 305
(SSC Section Officer (Commercial Audit) Exam. 26.11.2006 (Second Sitting)

8. The largest number, which divides 25, 73 and 97 to leave the same remainder in each case, is
(1) 24 (2) 23
(3) 21 (4) 6
(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

9. What is the greatest number which will divide 110 and 128 leaving a remainder 2 in each case ?
(1) 8 (2) 18
(3) 28 (4) 38
FCI Assistant Grade-III Exam. 05.02.2012 (Paper-I) East Zone (IInd Sitting)

10. A milkman has 75 litres milk in one can and 45 litres in another. The maximum capacity of container which can measure milk of either container exact number of times is :
(1) 1 litre (2) 5 litres
(3) 15 litres (4) 25 litres
(SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

11. What is the least number of square tiles required to pave the floor of a room 15 m 17 cm long and 9 m 2 cm broad?
(1) 840 (2) 841
(3) 820 (4) 814
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

12. Three sets of English, Mathematics and Science books containing 336, 240, 96 books respectively have to be stacked in such a way that all the books are stored subject-wise and the height of each stack is the same. Total number of stacks will be
(1) 14 (2) 21
(3) 22 (4) 48
(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

13. A farmer has 945 cows and 2475 sheep. He farms them into flocks, keeping cows and sheep separate and having the same number of animals in each flock. If these flocks are as large as possible, then the maximum number of animals in each flock and total number of flocks required for the purpose are respectively
(1) 15 and 228 (2) 9 and 380
(3) 45 and 76 (4) 46 and 75
(SSC (10+2) Level Data Entry Operator & LDC Exam. 11.12.2011 (Ist Sitting (Delhi Zone)

14. A milk vendor has 21 litres of cow milk, 42 litres of toned milk and 63 litres of double toned milk. If he wants to pack them in cans so that each can contains same litres of milk and does not want to mix any two kinds of milk in a can, then the least number of cans required is
(1) 3 (2) 6
(3) 9 (4) 12
(SSC Constable (GD) & Rifleman (GD) Exam. 22.04.2012 (IInd Sitting)

15. The greatest number that divides 411, 684, 821 and leaves 3, 4 and 5 as remainders, respectively, is
(1) 254 (2) 146
(3) 136 (4) 204
(SSC FCI Assistant Grade-III Main Exam. 07.04.2013)

16. Find the greatest number which will exactly divide 200 and 320.
(1) 10 (2) 20
(3) 16 (4) 40
(SSC CGL Tier-II Exam. 21.09.2014

17. 84 Maths books, 90 Physics books and 120 Chemistry books have to be stacked topicwise. How many books will be there in each stack so that each stack will have the same height too ?
(1) 12 (2) 18
(3) 6 (4) 21
(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 22.06.2014

18. The greatest number that will divide 729 and 901 leaving remainders 9 and 5 respectively, is
(1) 15 (2) 16
(3) 19 (4) 20
(SSC CHSL DEO Exam. 02.11.2014 (Ist Sitting)

19. Three tankers contain 403 litres, 434 litres, 465 litres of diesel respectively. Then the maximum capacity of a container that can measure the diesel of the three containers exact number of times is
(1) 31 litres (2) 62 litres
(3) 41 litres (4) 84 litres
(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 22.06.2014 TF No. 999 KP0)

20. There are 24 peaches, 36 apricots and 60 bananas and they have to be arranged in several rows in such a way that every row contains the same number of fruits of only one type. What is the minimum number of rows required for this to happen ?
(1) 12 (2) 9
(3) 10 (4) 6
(SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014, IInd Sitting TF No. 545 QP 6)

21. The greatest number by which 2300 and 3500 are divided leaving the remainders of 32 and 56 respectively, is
(1) 136 (2) 168
(3) 42 (4) 84
(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam, 21.06.2015 IInd Sitting)

22. The product of two 2–digit numbers is 2160 and their H.C.F. is 12. The numbers are
(1) (12, 60) (2) (72, 30)
(3) (36, 60) (4) (60, 72)
(SSC CGL Tier-I (CBE) Exam. 09.09.2016) (Ist Sitting)

23. Find the greatest number that will divide 390, 495 and 300 without leaving a remainder.
(1) 5 (2) 15
(3) 25 (4) 35
(SSC CGL Tier-I (CBE) Exam. 02.09.2016) (IInd Sitting)

24. In a school, 391 boys and 323 girls have been divided into the largest possible equal classes, so that each class of boys numbers the same as each class of girls. What is the number of classes ?
(1) 23 (2) 19
(3) 44 (4) 17
(SSC CGL Tier-I (CBE) Exam. 11.09.2016 (IInd Sitting)

25. Two pipes of length 1.5 m and 1.2 m are to be cut into equal pieces without leaving any extra length of pipes. The greatest length of the pipe pieces of same size which can be cut from these two lengths will be
(1) 0.13 metre (2) 0.4 metre
(3) 0.3 metre (4) 0.41 metre
(SSC CGL Tier-II (CBE) Exam. 12.01.2017)

TYPE–IV

1. The LCM and the HCF of the numbers 28 and 42 are in the ratio :
(1) 6 : 1 (2) 2 : 3
(3) 3 : 2 (4) 7 : 2
(SSC CGL Prelim Exam. 27.02.2000 (Second Sitting)

2. If the ratio of two numbers is 2 : 3 and their L.C.M. is 54, then the sum of the two numbers is
(1) 5 (2) 15
(3) 45 (4) 270
(SSC CPO S.I. Exam. 07.09.2003)

3. The ratio of two numbers is 4 : 5 and their L.C.M. is 120. The numbers are
(1) 30, 40 (2) 40, 32
(3) 24, 30 (4) 36, 20
(SSC CPO S.I. Exam. 07.09.2003)

4. Three numbers are in the ratio 2 : 3 : 4 and their H.C.F. is 12. The L.C.M. of the numbers is
(1) 144 (2) 192
(3) 96 (4) 72
(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

5. Two numbers are in the ratio 3 : 4. If their LCM is 240, the smaller of the two number is
(1) 100 (2) 80
(3) 60 (4) 50
(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

6. Two numbers are in the ratio 3 : 4. Their L.C.M. is 84. The greater number is
(1) 21 (2) 24
(3) 28 (4) 84
(SSC CGLTier-I Exam. 16.05.2010 (First Sitting)

7. Two numbers are in the ratio 3 : 4. If their HCF is 4, then their LCM is
(1) 48 (2) 42
(3) 36 (4) 24
(SSC CGL Prelim Exam. 24.02.2002 (First Sitting) & SSC (South Zone) Investigator Exam. 12.09.2010 & SSC MTS Exam. 10.03.2013)

8. The ratio of the sum to the LCM of two natural numbers is 7 : 12. If their HCF is 4, then the smaller number is :
(1) 20 (2) 16
(3) 12 (4) 8
(SSC CGL DEO & LDC Exam. 11.12.2011 (IInd Sitting (Delhi Zone)

9. Two numbers are in the ratio 3 : 4. The product of their H.C.F. and L.C.M. is 2028. The sum of the numbers is
(1) 68 (2) 72
(3) 86 (4) 91
(SSC DEO Exam. 02.08.2009)

10. The LCM of two numbers is 48. The numbers are in the ratio 2 : 3. The sum of the numbers is
(1) 28 (2) 32
(3) 40 (4) 64
(SSC Multi-Tasking (Non-Technical) Staff Exam. 27.02.2011)

11. The ratio of two numbers is 4 : 5 and their H.C.F. is 8. Then their L.C.M. is
(1) 130 (2) 140
(3) 150 (4) 160
(SSC CGL DEO & LDC Exam. 04.12.2011 (IInd Sitting (North Zone)

12. The ratio of two numbers is 3 : 4 and their HCF is 5. Their LCM is :
(1) 10 (2) 60
(3) 15 (4) 12
(SSC CAPFs SI & CISF ASI Exam. 23.06.2013)

13. Three numbers are in the ratio 1 : 2 : 3 and their HCF is 12. The numbers are
(1) 12, 24, 36 (2) 5, 10, 15
(3) 4, 8, 12 (4) 10, 20, 30
(SSC CGL Tier-I Exam. 19.10.2014 (Ist Sitting)

14. If $x : y$ be the ratio of two whole numbers and z be their HCF, then the LCM of those two numbers is
(1) yz (2) $\frac{xz}{y}$
(3) $\frac{xy}{z}$ (4) xyz
(SSC CHSL DEO & LDC Exam. 16.11.2014

15. The H.C.F. and L.C.M. of two numbers are 21 and 84 respectively. If the ratio the two numbers is 1 : 4, then the larger of the two numbers is
(1) 12 (2) 108
(3) 48 (4) 84
(SSC CGL Tier-II Exam, 25.10.2015, TF No. 1099685)

TYPE–V

1. The product of the LCM and HCF of two numbers is 24. The difference of the two numbers is 2. Find the numbers ?
(1) 8 and 6 (2) 8 and 10
(3) 2 and 4 (4) 6 and 4
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

2. The LCM of two numbers is 495 and their HCF is 5. If the sum of the numbers is 100, then their difference is :
(1) 10 (2) 46
(3) 70 (4) 90
(SSC CGL Prelim Exam. 04.07.1999 (Second Sitting)

3. Two numbers, both greater than 29, have HCF 29 and LCM 4147. The sum of the numbers is :
(1) 966 (2) 696
(3) 669 (4) 666
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting), & SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

4. The sum of the H.C.F. and L.C.M of two numbers is 680 and the L.C.M. is 84 times the H.C.F. If one of the number is 56, the other is :
(1) 84 (2) 12
(3) 8 (4) 96
(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

5. The sum of two numbers is 84 and their HCF is 12. Total number of such pairs of number is
(1) 2 (2) 3
(3) 4 (4) 5
(SSC HSL DEO & LDC Exam. 28.11.2010 (IInd Sitting)

6. The sum of a pair of positive integer is 336 and their H.C.F. is 21. The number of such possible pairs is
(1) 2 (2) 3
(3) 4 (4) 5
(SSC CGL DEO & LDC Exam. 04.12.2011 (Ist Sitting (North Zone)

7. The sum of two numbers is 45. Their difference is $\frac{1}{9}$ of their sum. Their L.C.M. is
(1) 200 (2) 250
(3) 100 (4) 150
(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

8. The H.C.F. of two numbers, each having three digits , is 17 and their L.C.M. is 714. The sum of the numbers will be :
(1) 289 (2) 391
(3) 221 (4) 731
(SSC CPO S.I. Exam. 16.12.2007)

9. The product of the LCM and the HCF of two numbers is 24. If the difference of the numbers is 2, then the greater of the number is
(1) 3 (2) 4
(3) 6 (4) 8
(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

10. The sum of two numbers is 216 and their HCF is 27. How many pairs of such numbers are there?
(1) 1 (2) 2
(3) 3 (4) 0
(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

11. The LCM of two numbers is 12 times their HCF. The sum of the HCF and the LCM is 403. If one of the number is 93, then the other number is
(1) 124 (2) 128
(3) 134 (4) 138
(SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

12. Sum of two numbers is 384. H.C.F. of the numbers is 48. The difference of the numbers is
(1) 100 (2) 192
(3) 288 (4) 336
(SSC CPO S.I. Exam. 06.09.2009)

13. The sum of two numbers is 36 and their H.C.F and L.C.M. are 3 and 105 respectively. The sum of the reciprocals of two numbers is
(1) $\frac{2}{35}$ (2) $\frac{3}{25}$
(3) $\frac{4}{35}$ (4) $\frac{2}{25}$
(SSC CGL Tier-I Exam. 16.05.2010 (Second Sitting) & SSC HSL DEO & LDC Exam. 28.11.2010)

14. L.C.M. of two numbers is 120 and their H.C.F. is 10. Which of the following can be the sum of those two numbers ?
(1) 140 (2) 80
(3) 60 (4) 70
(SSC CGL Tier-1 Exam 19.06.2011 (Second Sitting)

15. Three numbers which are co-prime to one another are such that the product of the first two is 551 and that of the last two is 1073. The sum of the three numbers is :
(1) 75 (2) 81
(3) 85 (4) 89
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

16. The sum of two numbers is 36 and their H.C.F. is 4. How many pairs of such numbers are possible ?
(1) 1 (2) 2
(3) 3 (4) 4
(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

17. If the HCF and LCM of two consecutive (positive) even numbers be 2 and 84 respectively, then the sum of the numbers is
(1) 30 (2) 26
(3) 14 (4) 34
(SSC CGL DEO & LDC Exam. 11.12.2011 (Ist Sitting (East Zone)

18. The LCM of two positive integers is twice the larger number. The difference of the smaller number and the GCD of the two numbers is 4. The smaller number is :
(1) 12 (2) 6
(3) 8 (4) 10
(SSC CGL DEO & LDC Exam. 21.10.2012, IInd Sitting)

19. The L.C.M. of two numbers is 20 times their H.C.F. The sum of H.C.F. and L.C.M. is 2520. If one of the number is 480, the other number is :
(1) 400 (2) 480
(3) 520 (4) 600
(SSC CPO S.I. Exam. 26.05.2005)

20. The LCM of two numbers is 44 times of their HCF. The sum of the LCM and HCF is 1125. If one number is 25, then the other number is
(1) 1100 (2) 975
(3) 900 (4) 800
(SSC CPO S.I. Exam 12.12.2010 (Paper-I)

21. If A and B are the H.C.F. and L.C.M. respectively of two algebraic expressions x and y, and $A + B = x + y$, then the value of $A^3 + B^3$ is
(1) $x^3 - y^3$ (2) x^3
(3) y^3 (4) $x^3 + y^3$
(SSC FCI Assistant Grade-III Main Exam. 07.04.2013)

22. HCF and LCM of two numbers are 7 and 140 respectively. If the numbers are between 20 and 45, the sum of the numbers is :
(1) 70 (2) 77
(3) 63 (4) 56
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

23. The number between 3000 and 4000 which is exactly divisible by 30, 36 and 80 is
(1) 3625 (2) 3250
(3) 3500 (4) 3600
(SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014 , Ist Sitting TF No. 333 LO 2)

24. Let x be the least number, which when divided by 5, 6, 7 and 8 leaves a remainder 3 in each case but when divided by 9 leaves no remainder. The sum of digits of x is
(1) 21 (2) 22
(3) 18 (4) 24
(SSC CGL Tier-II Exam, 25.10.2015, TF No. 1099685)

25. The greatest four digit number which is exactly divisible by each one of the numbers 12, 18, 21 and 28 is
(1) 9828 (2) 9288
(3) 9882 (4) 9928
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 01.11.2015, IInd Sitting)

26. A number x is divisible by 7. When this number is divided by 8, 12 and 16. It leaves a remainder 3 in each case. The least value of x is:
(1) 148 (2) 149
(3) 150 (4) 147
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 15.11.2015 (IInd Sitting) TF No. 7203752)

27. Let x be the smallest number, which when added to 2000 makes the resulting number divisible by 12, 16, 18 and 21. The sum of the digits of x is
(1) 7 (2) 5
(3) 6 (4) 4
(SSC CGL Tier-II Exam, 25.10.2015, TF No. 1099685)

28. The smallest five digit number which is divisible by 12,18 and 21 is :
(1) 10224 (2) 30256
(3) 10080 (4) 50321
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 06.12.2015 (IInd Sitting) TF No. 3441135)

29. A number between 1000 and 2000 which when divided by 30, 36 and 80 gives a remainder 11 in each case is
(1) 1451 (2) 1641
(3) 1712 (4) 1523
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 20.12.2015 (Ist Sitting) TF No. 9692918)

30. The number between 4000 and 5000 that is divisible by each of 12, 18, 21 and 32 is
(1) 4023 (2) 4032
(3) 4302 (4) 4203
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 20.12.2015 (Ist Sitting) TF No. 9692918)

31. If the product of three consecutive numbers is 210 then sum of the smaller number is :
(1) 3 (2) 4
(3) 5 (4) 11
(SSC CPO SI & ASI, Online Exam. 06.06.2016) (IInd Sitting)

TYPE–VI

1. The LCM of two multiples of 12 is 1056. If one of the number is 132, the other number is
(1) 12 (2) 72
(3) 96 (4) 132
(SSC CPO S.I. Exam. 06.09.2009)

2. The least number to be subtracted from 36798 to get a number which is exactly divisible by 78 is
(1) 18 (2) 60
(3) 38 (4) 68
(SSC CPO S.I. Exam. 06.09.2009)

3. Find the least multiple of 23, which when divided by 18, 21 and 24 leaves the remainder 7, 10 and 13 respectively.
(1) 3013 (2) 3024
(3) 3002 (4) 3036
(SSC CGL Prelim Exam. 24.02.2002 (First Sitting)

4. The greatest number, that divides 122 and 243 leaving respectively 2 and 3 as remainders, is
(1) 12 (2) 24
(3) 30 (4) 120
(SSC CGL Prelim Exam. 08.02.2004 (First Sitting)

5. If $P = 2^3.3^{10}.5$; $Q = 2^5.3.7$, then HCF of P and Q is :
(1) 2.3.5.7 (2) 3.2^3
(3) $2^2.3^7$ (4) $2^5.3^{10}.5.7$
(SSC CGL DEO & LDC Exam. 11.12.2011 (IInd Sitting (East Zone)

6. A fraction becomes $\frac{1}{6}$ when 4 is subtracted from its numerator and 1 is added to its denominator. If 2 and 1 are respectively added to its numerator and the denominator, it becomes $\frac{1}{3}$. Then, the LCM of the numerator and denominator of the said fraction, must be
(1) 14 (2) 350
(3) 5 (4) 70
(SSC CGL DEO & LDC Exam. 04.12.2011 (IInd Sitting (North Zone)

7. The HCF (GCD) of a, b is 12, a, b are positive integers and $a > b > 12$. The smallest values of (a, b) are respectively
(1) 12, 24 (2) 24, 12
(3) 24, 36 (4) 36, 24
(SSC CGL Tier-I Exam. 11.11.2012, Ist Sitting)

8. The number of pair of positive integers whose sum is 99 and HCF is 9 is
(1) 2 (2) 3
(3) 4 (4) 5
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 01.11.2015, IInd Sitting)

SHORT ANSWERS

TYPE-I

1. (3)	**2.** (3)	**3.** (3)	**4.** (2)
5. (1)	**6.** (4)	**7.** (2)	**8.** (2)
9. (2)	**10.** (3)	**11.** (3)	**12.** (1)
13. (4)	**14.** (2)	**15.** (4)	**16.** (1)
17. (3)	**18.** (4)	**19.** (1)	**20.** (4)
21. (2)	**22.** (1)	**23.** (2)	**24.** (1)
25. (2)	**26.** (2)	**27.** (4)	**28.** (4)
29. (4)	**30.** (3)		

TYPE-II

1. (3)	**2.** (4)	**3.** (4)	**4.** (3)
5. (4)	**6.** (2)	**7.** (3)	**8.** (1)
9. (2)	**10.** (3)	**11.** (4)	**12.** (2)
13. (2)	**14.** (2)	**15.** (3)	**16.** (4)
17. (4)	**18.** (2)	**19.** (4)	**20.** (2)
21. (2)	**22.** (3)	**23.** (1)	**24.** (2)
25. (1)	**26.** (1)	**27.** (3)	**28.** (2)
29. (3)	**30.** (1)	**31.** (1)	**32.** (4)
33. (1)	**34.** (2)	**35.** (1)	**36.** (3)
37. (2)	**38.** (2)	**39.** (2)	**40.** (2)
41. (2)	**42.** (2)	**43.** (2)	**44.** (4)
45. (2)	**46.** (4)	**47.** (3)	**48.** (2)
49. (2)	**50.** (1)	**51.** (1)	

TYPE-III

1. (1)	**2.** (3)	**3.** (2)	**4.** (1)
5. (1)	**6.** (3)	**7.** (1)	**8.** (1)
9. (2)	**10.** (3)	**11.** (4)	**12.** (1)
13. (3)	**14.** (2)	**15.** (3)	**16.** (4)
17. (3)	**18.** (2)	**19.** (1)	**20.** (3)
21. (4)	**22.** (3)	**23.** (2	**24.** (4)
25. (3)			

TYPE-IV

1. (1)	**2.** (3)	**3.** (3)	**4.** (1)
5. (3)	**6.** (3)	**7.** (1)	**8.** (3)
9. (4)	**10.** (3)	**11.** (4)	**12.** (2)
13. (1)	**14.** (4)	**15.** (4)	

TYPE-V

1. (4)	**2.** (1)	**3.** (2)	**4.** (4)
5. (2)	**6.** (3)	**7.** (3)	**8.** (3)
9. (3)	**10.** (2)	**11.** (1)	**12.** (3)
13. (3)	**14.** (4)	**15.** (3)	**16.** (3)
17. (2)	**18.** (3)	**19.** (4)	**20.** (1)
21. (4)	**22.** (3)	**23.** (4)	**24.** (3)
25. (1)	**26.** (4)	**27.** (1)	**28.** (3)
29. (1)	**30.** (2)	**31.** (4)	

TYPE-VI

1. (3)	**2.** (2)	**3.** (1)	**4.** (4)
5. (2)	**6.** (4)	**7.** (4)	**8.** (4)

EXPLANATIONS

TYPE-I

1. (3) Using Rule 1,
Required number

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

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

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

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

= 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,

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

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

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

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

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

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

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

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 × 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 = 13 xy
$\therefore$ 13 xy = 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 = 23 xy
As given,
23xy = 23 × 13 × 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 × 2
21 = 3 × 7
24 = 2^3 × 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 × 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 × 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 × 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

$\therefore$ LCM = 2 × 2 × 5 × 7 × 8
= 1120
$\therefore$ 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

$\therefore$ 60) 9999 (166
60
399
360
399
360
39

$\therefore$ 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

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

$\therefore$ 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

$\therefore$ LCM = 2 × 2 × 2 × 2 × 3 × 3 × 5
= 720

49. (2)

2	60
2	30
3	15
	5

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

50. (1) LCM of x and y = 161
$\therefore$ xy = 23 × 7
$\therefore$ x = 23; y = 7
$\therefore$ $3y - x = 3 \times 7 - 23$
= 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

$\therefore$ LCM = 2 × 2 × 2 × 2 × 3 × 3 × 3
= 432 seconds
= 7 minutes 12 second
$\therefore$ 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
$\therefore$ 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
×

$\therefore$ 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
×

$\therefore$ 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
×

$\therefore$ 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
$\therefore$ 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
×

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,
$12x \times 12y = 2160$

$\Rightarrow xy = \frac{2160}{12 \times 12} = 15$

$= 3 \times 5$ or 1×15
∴ Required numbers
$= 12 \times 3 = 36$ and $12 \times 5 = 60$

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

$= 2 \times 2 \times 7 \times 3 = 84$
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
$= 2 \times 2 \times 2 \times 3 \times 3 \times 2 = 144$

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 = $3x = 3 \times 20$
= 60

6. (3) Let the numbers be $3x$ and $4x$.
∴ Their LCM = $12x$
∴ $12x = 84$

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

∴ Larger number
$= 4x = 4 \times 7 = 28$

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

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
$= 4 \times 3 = 12$

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
$= 3x + 4x = 7x = 7 \times 13 = 91$

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

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
⇒ Numbers = zx and zy
∴ $zx \times zy = z \times$ LCM
⇒ LCM = xyz

15. (4) HCF of numbers = 21
∴ Numbers = $21x$ and $21y$ Where x and y are prime to each other.
Ratio of numbers = 1 : 4
∴ Larger number = 21 × 4 = 84

TYPE-V

1. (4) Using Rule 1,
Let the numbers be x and $(x+2)$.
∴ Product of numbers
= HCF × LCM
⇒ $x(x+2) = 24$
⇒ $x^2 + 2x - 24 = 0$
⇒ $x^2 + 6x - 4x - 24 = 0$
⇒ $x(x+6) - 4(x+6) = 0$
⇒ $(x-4)(x+6) = 0$
⇒ $x = 4$, as $x \neq -6 = 0$
∴ Numbers are 4 and 6.

2. (1) Using Rule 1,
Suppose 1st number is x then, 2nd number
= $100 - x$
∴ LCM × HCF = 1st number × 2nd number
⇒ $495 \times 5 = x \times (100 - x)$
⇒ $495 \times 5 = 100x - x^2$
⇒ $x^2 - 55x - 45x - 2475 = 0$
⇒ $(x-45)(x-55) = 0$
⇒ $x = 45$ 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.
∴ LCM of 29x and 29y = 29xy
Now, 29xy = 4147

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

Thus xy = 11 × 13
∴ Numbers are 29 × 11
= 319 and 29 × 13 = 377
∴ Required sum
= 377 + 319 = 696

4. (4) Let HCF be h and LCM be l.
Then, $l = 84h$ and $l + h$
= 680
⇒ $84h + h = 680$

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

∴ $l = 680 - 8 = 672$
∴ Other number

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

5. (2) HCF = 12
∴ Numbers = $12x$ and $12y$ where x and y are prime to each other.
∴ $12x + 12y = 84$
⇒ $12(x + y) = 84$

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

∴ 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.
∴ $21x + 21y = 336$
⇒ $21(x + y) = 336$

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

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

7. (3) Let the number be x and y.
According to the question,
∴ $x + y = 45$ ..... (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,
$x + y = 45$
$x - y = 5$
$2x = 50$
or, $x = 25$
∴ $y = 45 - 25 = 20$.
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,
$17xy = 714$

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

⇒ $x = 6$ and $y = 7$
or, $x = 7$ and $y = 6$.
∴ First number = $17x$
= 17 × 6 = 102
Second number = $17y$
= 17 × 7 = 119
∴ Sum of the numbers
= 102 + 119 = 221

9. (3) Using Rule 1,
Let the larger number be x.
∴ Smaller number = $x - 2$
∴ First number × Second number = HCF × LCM
⇒ $x(x-2) = 24$
⇒ $x^2 - 2x - 24 = 0$
⇒ $x^2 - 6x + 4x - 24 = 0$
⇒ $x(x-6) + 4(x-6) = 0$
⇒ $(x-6)(x+4) = 0$
⇒ $x = 6$ because $x \neq -4$

10. (2) HCF of two numbers = 27
∴ Let the numbers be $27x$ and $27y$ where x and y are prime to each other.
According to the question,
$27x + 27y = 216$
⇒ $27(x + y) = 216$

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

∴ Possible pairs of x and y = (1, 7) and (3, 5)
∴ Numbers =(27, 189) and (81, 135)

11. (1) Using Rule 1,
Let the HCF of numbers = H
∴ Their LCM = 12H
According to the question,
12H +H = 403
⇒13H = 403

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

⇒ 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
$\therefore\ y = 29$
$$\therefore\ x = \frac{551}{29} = 19$$
$$\text{and } z = \frac{1073}{29} = 37$$
$\therefore$ 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 yH $> x$H.
$\therefore$ LCM $= xy$ H
$\therefore\ xy$H $= 2y$H $\Rightarrow x = 2$
Again, xH $-$ H $= 4$
$\Rightarrow 2$H $-$ H $= 4 \Rightarrow$ H $= 4$
$\therefore$ Smaller number $= x$H $= 8$

19. (4) Using Rule 1,
Let the H.C.F. be H.
$\therefore$ L.C.M. $= 20$H
Then, H + 20H = 2520
$\Rightarrow 21$ H $= 2520$
$$\Rightarrow \text{H} = \frac{2520}{21} = 120$$
$\therefore$ L.C.M. $= 20$H $= 20 \times 120 = 2400$
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
$xy = AB$
$\Rightarrow x + y = A + B$ (given) ...(i)
$(x-y)^2 = (x + y)^2 - 4xy$
or, $(x-y)^2 = (A + B)^2 - 4\ AB$
or, $(x-y)^2 = (A - B)^2$
or, $(x-y) = A - B$ ...(ii)
Using (i) and (ii), we get
$x = A$ and $y = B$
$\therefore A^3 + B^3 = x^3 + y^3$

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 × 2 × 3 × 3 × 7= 252
The largest 4-digit number
= 9999

252) 9999 (39
756
2439
2268
171

$\therefore$ 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 × 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 × 3 + 3 = 144 + 3 = 147

27. (1)

2	12, 16, 18, 21
2	6, 8, 9, 21
3	3, 4, 9, 21
	1, 4, 3, 7

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

28. (3)

2	12, 18, 21
3	6, 9, 21
	2, 3, 7

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

29. (1)We find 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 × 2 × 3 × 3 × 4 × 5
= 720
$\therefore$ Required number
= 2 × 720 + 11
= 1440 + 11 = 1451

30. (2)

2	12, 18, 21, 32
2	6, 9, 21, 16
3	3, 9, 21, 8
	1, 3, 7, 8

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

31. (4)

2	210
3	105
5	35
	7

$\therefore$ 210 = 2 × 3 × 5 × 7 = 5 × 6 × 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 × 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

2	18, 21, 24
3	9, 21, 12
	3, 7, 4

LCM = 2 × 3 × 3 × 7 × 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 × 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 × 6 – 11) = 115 which is divisible by 23.
Therefore, the required least number
= 504 × 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)

TEST YOURSELF

1. The sum of two numbers is 1215 and their HCF is 81. How many such pairs of numbers can be formed?
(1) 3 (2) 4
(3) 6 (4) None of these

2. Three plots having an area of 132, 204 and 228 square metres respectively are to be subdivided into equal vegetable beds. If the breadth of a bed is 3 metres, find the maximum length that a bed can have.
(1) 14 metres (2) 4 metres
(3) 24 metres (4) 6 metres

3. Three plots having an area of 165, 195 and 285 square metres respectively are to be sub-divided into equalised flower beds. If the breadth of a bed is 3 metres, what will the maximum length of a bed?
(1) 5.5 metres (2) 6 metres
(3) 5 metres (4) 6.5 metres

4. A room is 26 metres long and 10 metres broad. Its floor is to be paved by square tiles. What will be the least number of tiles required to cover the floor completely ?
(1) 50 (2) 55
(3) 60 (4) 65

5. Find the least number of square tiles by which the floor of a room of dimensions 16.58 × 8.32 m can be covered completely?
(1) 348644 (2) 344864
(3) 384644 (4) None of these

6. A wine seller had three types of wine, 403 litres of 1st kind, 434 litres of 2nd kind and 465 litres of 3rd kind. Find the least possible number of casks of equal size in which different types of wine can be filled without mixing.
(1) 46 (2) 44
(3) 42 (4) 48

7. Find the greatest number which will divide 478 and 719 leaving remainders 2 and 5 respectively.
(1) 242 (2) 240
(3) 236 (4) 238

8. Find the greatest number which will divide 42, 49 and 56 and leave remainders 6, 7 and 8 respectively.
(1) 6 (2) 8
(3) 12 (4) 24

9. Find the greatest number which divides 99, 123 and 183 leaving the same remainder in each case.
(1) 11 (2) 12
(3) 13 (4) 14

10. On dividing the numbers 7654, 8506 and 9997 by a certain largest number, in each case the remainder is the same. Find the number and the remainder.
(1) 213 and 199
(2) 223 and 189
(3) 233 and 179
(4) None of these

11. The numbers 2270, 3739 and 6677 on being divided by a certain number of three digits, leave the same remainder. Find the number and the remainder respectively.
(1) 123, 20 (2) 113, 10
(3) 116, 20 (4) 118, 15

12. On being divided by a three digit number, the numbers 95336 and 91545 leave the same remainder. Find the number and the remainder.
(1) 234 and 109
(2) 233 and 105
(3) 223 and 115
(4) None of these

13. The numbers 11284 and 7655 when divided by a number of three digit, leave the same remainder. Find the number of three digits.
(1) 292 (2) 219
(3) 119 (4) 191

14. What is the greatest number that will divide 2930 and 3246 that will leave 7 as remainder in each case.
(1) 79 (2) 89
(3) 69 (4) 97

15. In finding the HCF of two numbers by division method, the last divisor is 49 and the quotients are 17, 3, 2. Find the two numbers.
(1) 243 and 4929
(2) 343 and 5929
(3) 334 and 5992
(4) None of these

16. In finding the HCF of two numbers by division method, the last divisor is 18 and quotients are 2, 7 and 3. Find the numbers.
(1) 639 and 846
(2) 369 and 864
(3) 396 and 846
(4) None of these

17. Find the HCF of 513, 1134 and 1215.
(1) 27 (2) 9
(3) 18 (4) 54

SHORT ANSWERS

1. (2)	**2.** (2)	**3.** (3)	**4.** (4)
5. (2)	**6.** (3)	**7.** (4)	**8.** (1)
9. (3)	**10.** (1)	**11.** (2)	**12.** (3)
13. (4)	**14.** (1)	**15.** (2)	**16.** (3)
17. (1)			

EXPLANATIONS

1. (2) Let the numbers be $81x$ and $81y$ where x and y are co-prime.

$\therefore 81x + 81y = 1215$

$$\Rightarrow x + y = \frac{1215}{81} = 15$$

Possible pairs
= (1, 14), (2, 13), (4, 11), (7, 8)

2. (2) The maximum area a bed can have will be the greatest divisor of three plots.
Now, HCF of 132, 204 and 228 = ?
HCF of 132 and 204

```
132)204(1
    132
     72)132(1
        72
        60)72(1
           60
           12)60(5
              60
              ×
```

The HCF of 132 and 204 = 12
The required HCF = HCF of 12 and 228.

12) 228 (19
12
108
108
×

Hence, the greatest area of the equalised bed = 12 sq.metres
∴ Maximum length of the bed

$= \frac{\text{Area}}{\text{Breadth}} = \frac{12}{3} = 4$ metres

3. (3) Maximum area of a bed = HCF of 165, 195 and 285.

165) 195 (1
165
30) 165 (5
150
15) 30 (2
30
×

15) 285 (19
15
135
135
×

∴ HCF = Maximum area = 15 sq. metres
Breadth = 3 metres

∴ Length $= \frac{15}{3}$ = 5 metres

4. (4) For the least number of tiles, each tile must be of maximum area.
Side of the largest tile = HCF of 26m and 10m
= HCF of 2 × 13m and 2 × 5 m = 2 metres
∴ Area of a tile = 2 × 2 = 4 sq. metres
∴ The least number of tiles

$= \frac{\text{Area of the floor}}{\text{Area of a tile}} = \frac{26 \times 10}{2 \times 2} = 65$

5. (2) We require the least number of square tiles, hence each tile must be of maximum dimensions.
Hence, the maximum dimensions of a tile
= HCF of 16.58 m and 8.32 m
Now, 16.58 m= 16.58 × 100 cm = 1658 cm
8.32 m = 8.32 ×100 cm = 832 cm

832) 1658 (1
832
826) 832 (1
826
6) 826 (137
6
22
18
46
42
4) 6 (1
4
2) 4 (2
4
×

Hence, the side of a square tile = 2 cm
∴ Required number of tiles

$= \frac{\text{Area of floor}}{\text{Area of a square tile}}$

$= \frac{1658 \times 832}{2 \times 2} = 344864$

6. (3) For the least possible number of casks of equal size, the size of each cask must be of the greatest capacity. Hence, the capacity of the cask will be equal to the HCF of 403*l*, 434*l* and 465*l*.
Now, HCF of 403 and 434.

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

Required HCF= HCF of 31 and 465

31) 465 (15
31
155
155
×

∴ Required HCF = 31 litres = Capacity of a cask.
So, required number of casks

$= \frac{403}{31} + \frac{434}{31} + \frac{465}{31}$

= 13 + 14 + 15 = 42

7. (4) We can understand the problem in better way in this form, i.e., (478 – 2) = 476 and (719 – 5) = 714 will be completely divisible by that number to be found. For this to happen we take the HCF Of 476 and 714.

476) 714 (1
476
238) 476 (2
476
×

∴ Required number = HCF of 476 and 714 = 238

8. (1) Take the HCF of (42 – 6) = 36, (49 – 7) = 42 and (56 – 8) = 48

36) 42 (1
36
6) 36 (6
36
×

And, HCF of 6 and 48 is also 6.
So, the required greatest number will be 6.

9. (3) Let *x* be the remainder. Then (99 – *x*), (123 – *x*) and (183 – *x*) will be exactly divisible by the required number. As discussed under division method of HCF, any number which divides the given number, also divides their difference. In other words, HCF of given numbers is same as the HCF of their difference.
∴ Required number
= HCF of (123 – *x*) – (99 – *x*), (183– *x*) – (123 – *x*) and (183 – *x*) – (99 – *x*)
= HCF of (123 – 99), (183 – 123) and (183 – 99)
= HCF of 24, 60 and 84
Now, 24 = 2 × 2 × 2 × 3
60 = 2 × 2 × 3 × 5
84 = 2 × 2 × 3 × 7
∴ Required HCF = 2 × 2 × 3 = 12
∴ Required number = 13

10. (1) Let the remainder be *x*.
Then (7654 – *x*), (8506 – *x*) and (9997 – *x*) are exactly divisible by that number.
Hence the required number
= HCF of (7654 – *x*),(8506 – *x*) and (9997 – *x*)
= HCF of (8506 – *x*) – (7654 – *x*), (9997 – *x*) – (8506 – *x*) and (9997 – *x*) – (7654 – *x*) = HCF of 852, 1491 and 2343

852) 1491 (1
852
639) 852 (1
639
213) 639 (3
639
×

Now, HCF of 213 and 2343

213) 2343 (11
213
213
213
×

Hence required number = 213

Required remainder = 7654 ÷ 213

213) 7654 (35
639
1264
1065
199

Hence required remainder = 199

11. (2) As done in the previous question, the greatest common divisor

= HCF of (3739 – 2270), (6677 – 3739) and (6677 – 2270)

= HCF of 1469, 2938 and 4407

Now, 1469 = 1469 × 1

2938 = 1469 × 2

4407 = 1469 × 3

∴HCF = 1469

Now, 1469 = 113 × 13

Since, (2270 – *R*), (3739 – *R*) and (6677 – *R*), where *R* is the remainder, are exactly divisible by 1469, hence these are also exactly divisible by its factors 13 and 113. The three digit number is 113. Now the above mentioned numbers can be written as

2270 = (113 × 20) + 10

3739 = (113 × 33) + 10

6677 = (113 × 59) + 10

Hence, the required number is 113 and the remainder is 10.

12. (3) Let the remainder in each case be *x*.

Then, the numbers (95336 – *x*) and (91545 – *x*) will be exactly divisible by that three digit number.

As discussed earlier, the difference of the two numbers, i.e.,

[(95336 – *x*) – (91545 – *x*)] or, 3791 is exactly divisible by the three digit number. In other words, that three digit number will be a factor of 3791.

Now, 3791= 17 × 223

Since, the factors of 3791 have only 223 as three digit factor.

So, Required number = 223

Now, we divide 95336 by 223 to get remainder.

223) 95336 (427
892
613
446
1676
1561
Remainder → 115

13. (4) Let the remainder in each case be *x*.

Then, (11284 – *x*) and (7655 – *x*) are exactly divisible by that three digit number.

Hence, their difference is [(11284 – *x*) – (7655 – *x*] = 3629 will also be exactly divisible by that three digit number. In other words that divisor will be a factor of 3629.

Now, 3629 = 19 ×191

Since both 19 and 191 are prime numbers, the three digit number is 191.

Hence, the required number = 191

14. (1) Obviously, the greatest number will divide completely the numbers (2930 – 7) and (3246 – 7), i.e., 2923 and 3239.

Hence, the greatest number will be the HCF of 2923 and 3239.

2923) 3239 (1
2923
316) 2923 (9
2844
79) 316 (4
316
×

∴HCF = 79

Hence, the required number = 79

15. (2) Here, the last divisor = 49 and quotient = 2

or, Symbolically the process of finding the HCF by division method can be shown in this way.

a) *b* (17
17*a*
c) *a* (3
3*c*
49) *c* (2
c
x

the dividend (c) = 49 × 2 = 98

Now, divisor = 98,

quotient = 3

and remainder = 49

∴ Dividend (*a*) = 98 × 3 + 49 = 294 + 49 = 343

Again, divisor = 343,

quotient = 17

and remainder = 98

∴ Dividend (*b*) = 343 × 17 + 98 = 5831+ 98 = 5929

Thus, two numbers are 343 and 5929.

Short-cut method :

	a	*b*	*c*	49
Remainders →		17	3	2

Let two numbers are *a* and *b*.

c = 2 × 49 = 98

b = 3*c* + 49 = 3 × 98 + 49 = 343

a = 17*b*+*c* = 17×343 + 98 = 5929

16. (3) Last divisor = 18 and quotient = 3

∴ Dividend = 18 × 3 = 54

Now, divisor = 54, quotient = 7 and remainder = 18

∴ Dividend = 7 × 54 + 18

= 378 + 18 = 396

Now, divisor = 396, quotient = 2 and remainder = 54

∴ Dividend = 2 × 396 + 54 = 792 + 54 = 846

Hence, the required numbers are 396 and 846.

17. (1) At first, we find out the HCF of 1134 and 1215

1134)1215(1
1134
81)1134(14
81
324
324
×

∴ HCF of 1134 and 1215 is 81.

∴ Required HCF = HCF of 513 and 81.

81)513(6
486
27)81(3
81
×

∴ HCF of given numbers = 27