Practice Exercise

Level - I

1. The greatest number which will divide 116, 221, 356 leaving the same remainder in each case is
(a) 15 (b) 5
(c) 10 (d) 20

2. What number has to be added to 345670 in order to make it divisible by 6?
(a) 2 (b) 4
(c) 5 (d) 6

3. The least number which when divided by 35 leaves a remainder 25, when divided by 45 leaves the remainder 35 and when divided by 55 leaves 45 is
(a) 3465 (b) 3645
(c) 3655 (d) 3455

4. If n is any even number, then $n\,(n^2 + 20)$ is always divisible by
(a) 15 (b) 20
(c) 24 (d) 32

5. When 2^{256} is divided by 17 the remainder would be
(a) 1 (b) 16
(c) 14 (d) None of these

6. The last digit of 2137^{753} is
(a) 9 (b) 7
(c) 3 (d) 1

7. Find the least square number which is divisible by 3, 5, 6, and 9.
(a) 900 (b) 90
(c) 8100 (d) 81

8. In order that the number 1 y 3 y 6 be divisible by 11, the digit y should be
(a) 1 (b) 2
(c) 5 (d) 6

9. If n is an even natural number, then the largest natural number by which n $(n + 1)\,(n + 2)$ is divisible is
(a) 6 (b) 8
(c) 12 (d) 24

10. Which number should be added to 459045 to make it exactly divisible by 27 ?
(a) 3 (b) 9
(c) 0 (d) None of these

11. Find the last digit of the sum $19^{81} + 4^{9k}$, $K \in N$.
(a) 4 (b) 9
(c) 3 (d) Cannot be determined

12. The sum of prime numbers that are greater than 60, but less than 70 is
(a) 128 (b) 191
(c) 197 (d) 260

13. The number 3113113113113113113113 is
(a) divisible by 3 but not by 11
(b) divisible by 11 but not by 3
(c) divisible by both 3 and 11
(d) neither divisible by 3 nor by 11

14. A difference between two numbers is 1365, when larger number is divided by the smaller one, the quotient is 6 and the remainder is 15. What is the smaller number?
(a) 240 (b) 360
(c) 270 (d) 295

15. If the number 517 * 324 is completely divisible by 3, then the smallest whole number in place of * will be:
(a) 0 (b) 1
(c) 2 (d) None of these

16. If the product 4864 × 9 P 2 is divisible by 12, the value of P is
(a) 2 (b) 5
(c) 6 (d) None of these

17. The largest 4-digit number exactly divisible by 88 is
(a) 9944 (b) 9768
(c) 9988 (d) 8888

18. $(x^n - a^n)$ is completely divisible by $(x + a)$, when
(a) n is any natural number
(b) n is an even natural number
(c) n is an odd natural number
(d) n is prime

19. When $0.\overline{47}$ is converted into a fraction the result is
(a) $\frac{46}{90}$ (b) $\frac{46}{99}$
(c) $\frac{47}{90}$ (d) $\frac{47}{99}$

20. Which of the following statements are true:
(i) The rational number $\frac{29}{23}$ lies to the left of zero on the number line.
(ii) The rational number $\frac{-12}{-17}$ lies to the right of zero on the number line.
(iii) The ratinal numbers $\frac{-12}{5}$ and $\frac{-7}{17}$ are on the opposite side of zero on the number line.
(v) The rational numbers $\frac{-21}{5}$ and $\frac{7}{-31}$ are on the opposite side of zero on the number line.
(a) Only (i) (b) (i) & (ii)
(c) Only (iii) (d) (i), (ii) & (iv)

21. I have a certain number of beads which lie between 600 and 900. If 2 beads are taken away the remainder can be equally divided among 3, 4, 5, 6, 7 or 12 boys. The number of beads I have
(a) 729 (b) 842
(c) 576 (d) 961

22. Find the digit at the unit's place of
$(377)^{59} \times (793)^{87} \times (578)^{129} \times (99)^{99}$
(a) 1 (b) 2
(c) 7 (d) 9

23. Four different electronic devices make a beep after every 30 minutes, 1 hour, $1\frac{1}{2}$ hour and 1 hour 45 minutes respectively. All the devices beeped together at 12 noon. They will again beep together at:
(a) 12 midnight (b) 3 a.m.
(c) 6 a.m. (d) 9 a.m.

24. If N is the sum of first 13,986 prime numbers, then N is always divisible by
(a) 6 (b) 4
(c) 8 (d) None of these

25. If two numbers when divided by a certain divisor give remainder 35 and 30 respectively and when their sum is divided by the same divisor, the remainder is 20, then the divisor is
(a) 40 (b) 45
(c) 50 (d) 55

26. Find the least number which when divided by 12, leaves a remainder 7, when divided by 15, leaves a remainder 10 and when divided by 16, leaves a remainder 11
(a) 115 (b) 235
(c) 247 (d) 475

27. How many even integers n, where $100 \le n \le 200$, are divisible neither by seven nor by nine ?
(a) 40 (b) 37
(c) 39 (d) 38

28. A number is *interesting* if on adding the sum of the digits of the number and the product of the digits of the number, the result is equal to the number. What fraction of numbers between 10 and 100 (both 10 and 100 included) is *interesting?*
(a) 0.1 (b) 0.11
(c) 0.16 (d) 0.22

29. In a cricket match, Team A scored 232 runs without losing a wicket. The score consisted to byes, wides and runs scored by two opening batsmen : Ram and Shyam. The runs scored by the two batsman are 26 times wides. There are 8 more byes than wides. If the ratio of the runs scored by Ram and Shyam is 6 : 7, then the runs scored by Ram is
(a) 88 (b) 96
(c) 102 (d) 112

30. If $x+y+z=1$ and x, y, z are positive real numbers, then the least value of $\left(\frac{1}{x}-1\right)\left(\frac{1}{y}-1\right)\left(\frac{1}{z}-1\right)$ is
(a) 4 (b) 8
(c) 16 (d) None of these

31. The last digit of $3^{3^{4n}} + 1$, is
(a) 0 (b) 4
(c) 8 (d) 2

32. The last digit in $(25\_)^{32}$ and $(25\_)^{33}$ both is 6. The missing digit is :
(a) 4 (b) 8
(c) 6 (d) 5

33. Which digits should come in place of * and $ if the number 62684*$ is divisible by both 8 and 5?
(a) 4, 0 (b) 0, 4
(c) 0, 0 (d) 4, 4

34. At a college football game, 4/5 of the seats in the lower deck of the stadium were sold. If 1/4 of all the seating in the stadium is located in the lower deck, and if 2/3 of all the seats in the stadium were sold, then what fraction of the unsold seats in the stadium was in the lower deck ?
(a) 3/20 (b) 1/6
(c) 1/5 (d) 1/3

35. The integers 1, 2, ..., 40 are written on a blackboard. The following operation is then repeated 39 times; In each repetition, any two numbers, say a and b, currently on the blackboard are erased and a new number a + b – 1 is written. What will be the number left on the board at the end?
(a) 820 (b) 821
(c) 781 (d) 819

36. If $653xy$ is divisible by 80 then the value of $x + y$ is
(a) 2 (b) 3
(c) 4 (d) 6

37. How many numbers are there between 200 and 800 which are divisible by both 5 and 7?
(a) 35 (b) 16
(c) 17 (d) can't be determined

38. How many numbers are there in the set $S = \{200, 201, 202, ...,800\}$ which are divisible by neither of 5 or 7?
(a) 411 (b) 412
(c) 410 (d) None of these

39. When a number divided by 9235, we get the quotient 888 and the remainder 222, such a least possible number is
(a) 820090 (b) 8200920
(c) 8200680 (d) None of these

40. A number which when divided by 32 leaves a remainder of 29. If this number is divided by 8 the remainder will be
(a) 0 (b) 1
(c) 5 (d) 3

41. $(0.\overline{1})^2\left[1-9(0.\overline{16})^2\right] = ?$
(a) $-\frac{1}{162}$ (b) $\frac{1}{108}$
(c) $\frac{7696}{106}$ (d) $\frac{833}{88209}$

42. A six digit number which is consisting of only one digits either 1, 2, 3, 4, 5, 6, 7, 8 or 9, *e.g.,* 111111, 222222... etc. This number is always divisible by :
(a) 7 (b) 11
(c) 13 (d) All of these

43. Product of divisors of 7056 is
(a) $(84)^{48}$ (b) $(84)^{44}$
(c) $(84)^{45}$ (d) None of these

44. The first 23 natural numbers are written in increasing order beside each other to form a single number. What is the remainder when this number is divided by 18?
(a) 1 (b) 6
(c) 12 (d) 15

45. How many positive integer values of 'a' are possible such that $\frac{a+220}{a+4}$ is an integer?
(a) 8 : 9 (b) 9 : 8
(c) 3 : 4 (d) 4 : 3

46. The sum and number of even factors of 2450.
(a) 9,3534 (b) 18,3500
(c) 12,3524 (d) 4,2453

47. Find the sum of divisors of 544 which are perfect squares.
(a) 32 (b) 64
(c) 42 (d) 21

48. Find the number of zeroes in
$100^1 \times 99^2 \times 98^3 \times 97^4 \times \ldots\ldots\ldots \times 1^{100}$
(a) 1024 (b) 250
(c) 1124 (d) 124

49. $(23)_5 + (47)_9 = (?)_8$
(a) 70 (b) 35
(c) 64 (d) 18

50. LCM of first 100 natural numbers is N. What is the LCM of first 105 natural numbers?
(a) $5! \times N$ (b) $10403\ N$
(c) $105N/103$ (d) $4\ N$

51. $N!$ is completely divisible by 13^{52}. What is sum of the digits of the smallest such number N?
(a) 11 (b) 15
(c) 16 (d) 19

52. $12^{55}/3^{11} + 8^{48}/16^{18}$ will give the digit at units place as
(a) 4 (b) 6
(c) 8 (d) 0

53. The unit digit in the expression
$36^{234}*33^{512}*39^{180} - 54^{29}*25^{123}*31^{512}$ will be
(a) 8 (b) 0
(c) 6 (d) 5

54. The last digit of the LCM of $(3^{2003} - 1)$ and $(3^{2003} + 1)$ is
(a) 8 (b) 2
(c) 4 (d) 6

55. Three persons start walking together and their steps measure 40 cm, 42 cm and 45 cm respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?
(a) 25 m 20 cm (b) 50 m 40 cm
(c) 75 m 60 cm (d) 100 m 80 cm

56. The sum of first n odd numbers (*i.e.*, $1 + 3 + 5 + 7 + \ldots + 2n - 1$) is divisible by 11111 then the value of n is
(a) 12345 (b) 11111
(c) can't be determined (d) None of these

57. Which of the following is/are true?
(i) $43^3 - 1$ is divisible by 11
(ii) $56^2 + 1$ is divisible by 19
(iii) $50^2 - 1$ is divisible by 17
(iv) $(729)^5 - 729$ is divisible by 5
(a) (i) and (ii) (b) (iii) and (iv)
(c) (ii), (iii) and (iv) (d) (ii) and (iii)

58. The remainder when $6^{6^{6^{6^{6\ldots\infty \text{ times}}}}}$ is divided by 10 is
(a) 3 (b) 6
(c) 0 (d) can't be determined

59. The last two-digits in the multiplication
$122 \times 123 \times 125 \times 127 \times 129$ will be
(a) 20 (b) 50
(c) 30 (d) 40

60. Find $GCD\ (2^{100} - 1, 2^{120} - 1)$.
(a) $2^{20} - 1$ (b) $2^{40} - 1$
(c) $2^{60} - 1$ (d) $2^{10} - 1$

61. How many natural numbers are there which give a remainder of 41 after dividing 1997?
(a) 2 (b) 4
(c) 6 (d) None of these

62. Find the remainder when $6^{6^{6^{\cdot^{\cdot^{\cdot^{6}}}}}}$ (100 times) when divided by 10?
(a) 6 (b) 2
(c) 4 (d) 8

63. Find the unit digit of the expression $199^{2n} + 144^{3n}$, where n is a natural number.
(a) 5 (b) 7
(c) either 5 or 7 (d) 3

64. The greatest number that can divide 140, 176, 264 leaving remainders of 4, 6, and 9 respectively is
[*SSC-Sub. Ins.-2012*]
(a) 85 (b) 34
(c) 17 (d) 2

65. The ratio of two numbers is 3 : 4 and their HCF is 5. Their LCM is: [*SSC-Sub. Ins.-2013*]
(a) 10 (b) 60
(c) 15 (d) 12

66. 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 container exact number of times is [*SSC-Sub. Ins.-2014*]
(a) 31 litres (b) 62 litres
(c) 41 litres (d) 84 litres

67. L.C.M. of $\frac{2}{3}, \frac{4}{9}, \frac{5}{6}$ is [*SSC 10+2-2013*]
(a) $\frac{20}{27}$ (b) $\frac{8}{27}$
(c) $\frac{20}{3}$ (d) $\frac{10}{3}$

68. If the sum of the digits of any integer lying between 100 and 1000 is subtracted from the number, the result always is [*SSC 10+2-2013*]
(a) divisible by 5 (b) divisible by 6
(c) divisible by 2 (d) divisible by 9

69. If a number is as much greater than 31 as it is less than 75, then the number is. [*SSC 10+2-2013*]
(a) 53 (b) 106
(c) 44 (d) 74

70. 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 [*SSC 10+2-2014*]
(a) 147 (b) 528
(c) 132 (d) 264

71. The sum of five consecutive odd numbers is 265. What is the sum of the largest number and twice the smallest number? [*IBPS Clerk-2012*]
(a) 156 (b) 153
(c) 155 (d) 151
(e) None of these

72. 'A', 'B' and 'C' are three consecutive even integers such that four times 'A' is equal to three times 'C'. What is the value of B ? [*IBPS Clerk-2012*]
(a) 12 (b) 10
(c) 16 (d) 14
(e) None of these

Level - II

1. What is the remainder obtained on dividing $34^{43} + 43^{34}$ by 7 ?
(a) 4 (b) 3 (c) 1 (d) 0

2. Two different prime numbers X and Y, both are greater than 2, then which of the following must be true ?
(a) $X - Y = 23$ (b) $X + Y \neq 87$
(c) Both (a) and (b) (d) None of these

3. What is the remainder when 1! + 2! + 3! ..... + 100! is divided by 7 ?
(a) 0 (b) 5 (c) 6 (d) 3

4. On dividing 2272 as well as 875 by 3-digit number N, we get the same remainder. The sum of the digits of N is:
(a) 10 (b) 11 (c) 12 (d) 13

5. Which one of the following numbers will completely divide $(3^{25} + 3^{26} + 3^{27} + 3^{28})$?
(a) 11 (b) 16 (c) 25 (d) 30

6. There are two integers 34041 and 32506, when divided by a three-digit integer n, leave the same remainder. What is the value of n?
(a) 298 (b) 307
(c) 461 (d) can't be determined

7. After distributing the sweets equally among 25 children, 8 sweets remain. Had the number of children been 28, 22 sweets would have been left after equally distributing. What was the total number of sweets ?
(a) 328 (b) 348
(c) 358 (d) Data inadequate

8. Find the remainder when 7^{99} is divided by 2400.
(a) 1 (b) 343 (c) 49 (d) 7

9. A number N when factorized can be written as $N = p_1^4 \times p_2^3 \times p_3^7$. Find the number of perfect squares which are factors of N. (The 3 prime numbers $p_1, p_2, p_3 > 2$)
(a) 12 (b) 24 (c) 36 (d) 6

10. The number $\log_2 7$ is
(a) An integer (b) A rational number
(c) An irrational number (d) A prime number

11. Which of the following in true ?
(a) The cube of an odd integer is of the form $8q + 1$, where q is an integer .
(b) The square of an odd integer is of the form $8q + 1$, where q is an integer .
(c) The fourth power of any integer is of the form $10q + 1$, where q is an integer
(d) None of these

12. $94^3 - 23^3 - 71^3$ is atleast divisible by
(a) 71 and 23 (b) 23 and 74
(c) 71 and 94 (d) 23, 71 and 94

13. How many whole numbers between 100 and 800 contain the digit 2?
(a) 200 (b) 214 (c) 220 (d) 240

14. p, q and r are three non-negative integers such that $p + q + r = 10$. The maximum value of $pq + qr + pr + pqr$ is
(a) ≥ 40 and < 50 (b) ≥ 50 and < 60
(c) ≥ 60 and < 70 (d) ≥ 70 and < 80

15. Let a, b, c, d and e be integers such that $a = 6b = 12c$, and $2b = 9d = 12e$. Then which of the following pairs contains a number that is not an integer?
(a) $\left(\frac{a}{27}, \frac{b}{e}\right)$ (b) $\left(\frac{a}{36}, \frac{c}{e}\right)$
(c) $\left(\frac{a}{12}, \frac{bd}{18}\right)$ (d) $\left(\frac{a}{6}, \frac{c}{d}\right)$

16. If $x = (16^3 + 17^3 + 18^3 + 19^3)$, then x divided by 70 leaves a remainder of
(a) 0 (b) 1 (c) 69 (d) 35

17. Find the total number of prime factors in $2^{17} \times 6^{31} \times 7^5 \times 10^{11} \times 11^{10} \times (323)^{23}$
(a) 162 (b) 161 (c) 346 (d) 97

18. The digits of a three-digit number A are written in the reverse order to form another three-digit number B. If $\boldsymbol{B > A}$ and $\boldsymbol{B - A}$ is perfectly divisible by 7, then which of the following is necessarily true?
(a) $100 < \boldsymbol{A} < 299$ (b) $106 < \boldsymbol{A} < 305$
(c) $112 < \boldsymbol{A} < 311$ (d) $118 < \boldsymbol{A} < 317$

19. If $N = 1! - 2! + 3! - 4! + \ldots\ldots + 47! - 48! + 49!$, then what is the unit digit of N^N?
(a) 0 (b) 9 (c) 7 (d) 1

20. The digits of a 3-digit number in Base 4 get reversed when it is converted into Base 3. How many such numbers exist?
(a) 0 (b) 1 (c) 2 (d) 3

21. Find the remainder when $73 \times 75 \times 78 \times 57 \times 197$ is divided by 34.
(a) 22 (b) 30 (c) 15 (d) 28

22. Find the HCF of $(3^{125} - 1)$ and $(3^{35} - 1)$.
(a) 5 (b) 3
(c) $(3^5 - 1)$ (d) $(3^{35} - 1)$

23. A computer program was tested 300 times before its release. The testing was done in three stages of 100 tests each. The software failed 15 times in Stage I, 12 times in Stage II, 8 times in Stage III, 6 times in both Stage I and Stage II, 7 times in both Stage II and Stage III, 4 times in both Stage I and Stage III, and 4 times in all the three stages. How many times the software failed in a single stage only?
(a) 10 (b) 13 (c) 15 (d) 17

24. Let x denote the greatest 4-digit number which when divided by 6, 7, 8, 9 and 10 leaves a remainder of 4, 5, 6 7 and 8 respectively. Then, the sum of the four-digits of x is and 8 respectively. Then, the sum of the four-digits of x is
(a) 25 (b) 18 (c) 20 (d) 22

25. A is the set of the first 100 natural numbers. What is the minimum number of elements that should be picked from A to ensure that atleast one pair of numbers whose difference is 10 is picked?
(a) 51 (b) 55 (c) 20 (d) 11

26. The power of 45 that will exactly divide 123! is
(a) 28 (b) 30 (c) 31 (d) 59

27. What is the remainder when ${}_{32}32^{32}$ is divided by 7?
(a) 2 (b) 3 (c) 4 (d) 6

28. Two different two-digit natural numbers are written beside each other such that the larger number is written on the left. When the absolute difference of the two numbers is subtracted from the four-digit number so formed, the number obtained is 5481. What is the sum of the two two-digit numbers?
(a) 70 (b) 71 (c) 72 (d) 73

29. In a three-digit number, the unit digit is twice the tens digit and the tens digit is twice the hundreds digit. The same number is written as $1XY$ and $1YX$ in base 8 and base 9 respectively. Find the sum of X and Y in the decimal system.
(a) 15 (b) 7
(c) 11 (d) Cannot be determined

30. $$a + \cfrac{1}{b + \cfrac{1}{c + \cfrac{1}{d + \ldots}}}$$
If a, b, c, d etc. are positive integers, then what is the value of 'b'?
(a) 2 (b) 4 (c) 3 (d) 5

31. If m and n are positive integers such that $(m-n)^2 = \dfrac{4mn}{(m+n-1)}$, then how many pairs (m, n) are possible?
(a) 4 (b) 10 (c) 16 (d) Infinite

32. $x^2 - 3y^2 = 1376$
How many integer solutions exist for the given equation?
(a) One (b) Two (c) Four (d) Zero

33. The number of zeros at the end of the product of $222^{111} \times 35^{53} + (7!)^{6!} \times (10!)^{5!} + 42^{42} \times 25^{25}$ is
(a) 42 (b) 53
(c) 1055 (d) None of these

34. The highest power of 17 which can divide exactly the following expression :
$(18^2 - 1)(18^4 - 1)(18^6 - 1)(18^8 - 1)(18^{10} - 1) \times \ldots (18^{16} - 1)(18^{18} - 1)$ is :
(a) 1 (b) 17
(c) 9 (d) can't be determined

35. The remainder when $2^2 + 22^2 + 222^2 + 2222^2 + \ldots\ldots$ (222 ……49 twos)^2 is divided by 9 is:
(a) 2 (b) 5 (c) 6 (d) 7

36. Find the last non-zero digit of 96!.
(a) 2 (b) 4 (c) 6 (d) 8

37. When 96 is added to a N^2, it gives another perfect square. If N is a natural no., how many distinct values of N are possible?
(a) 3 (b) 4
(c) 5 (d) None of these

38. The numbers 1 to 29 are written side by side as follows
1234567891011..... 28 29
If the number is divided by 9, then what is the remainder?
(a) 3 (b) 1
(c) 0 (d) None of these

39. The remainder when the number 1234567891011 12…… 484950 is divided by 16 is
(a) 3 (b) 4 (c) 5 (d) 6

40. The product of three consecutive even numbers is 4032. The product of the first and the third number is 252. What is five times the second number ? [*IBPS-PO-2012*]
(a) 80 (b) 100 (c) 60 (d) 70
(e) 90

41. What would be the sum of [*SSC CGL-2012*]
$1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + \ldots\ldots$ up to 15th term?
(a) 250 (b) 240
(c) 225 (d) 265

42. The least number which when divided by 48, 64, 90, 120 will leave the remainders 38, 54, 80, 110 respectively, is [*SSC CGL-2012*]
(a) 2870 (b) 2860 (c) 2890 (d) 2880

43. If $1^3 + 2^3 + \ldots\ldots + 9^3 = 2025$, then the approx. value of $(0.11)^3 + (0.22)^3 + \ldots\ldots + (0.99)^3$ is [*SSC CGL-2012*]
(a) 0.2695 (b) 0.3695 (c) 2.695 (d) 3.695

44. If the product of first fifty positive consecutive integers be divisible by 7^n, where n is an integer, then the largest possible value of n is [*SSC CGL-2014*]
(a) 7 (b) 8 (c) 10 (d) 5