1. Total numbers of 3-digit numbers that are divisible by 6 and can be formed by using the digits $1,\ 2,\ 3,\ 4,\ 5$ with repetition, is _____

2. Let 5 digit numbers be constructed using the digits $0, 2, 3, 4, 7, 9$ with repetition allowed, and are arranged in ascending order with serial numbers. Then the serial number of the number 42923 is _____ .

3. Numbers are to be formed between 1000 and 3000, which are divisible by 4, using the digits $1, 2, 3, 4, 5$ and 6 without repetition of digits. Then the total number of such numbers is _____.

4. The letters of the word 'MANKIND' are written in all possible orders and arranged in serial order as in an English dictionary. Then the serial number of the word 'MANKIND' is _____ .

5. A number is called a palindrome if it reads the same backward as well as forward. For example 285582 is a six digit palindrome. The number of six digit palindromes, which are divisible by 55, is _____.

6. The number of five-digit numbers, greater than 40000 and divisible by 5, which can be formed using the digits $0,\ 1,\ 3,\ 5,\ 7$ and 9 without repetition, is equal to
(1) 132
(2) 120
(3) 72
(4) 96

7. The number of arrangements of the letters of the word "INDEPENDENCE" in which all the vowels always occur together is
(1) 16800
(2) 33600
(3) 18000
(4) 14800

8. If the number of words, with or without meaning. which can be made using all the letters of the word MATHEMATICS in which C and S do not come together, is $(6!)k$ then k is equal to
(1) 2835
(2) 5670
(3) 1890
(4) 945

9. Number of 4-digit numbers (the repetition of digits is allowed) which are made using the digits $1,\ 2,\ 3$ and 5 , and are divisible by 15 , is equal to

10. Total number of $6-$ digit numbers in which only and all the five digits $1, 3, 5, 7$ and 9 appears, is
(1) $\frac{1}{2}(6!)$
(2) $6!$
(3) 5^6
(4) $\frac{5}{2}(6!)$

11. The number of 4-letter words, with or without meaning, each consisting of 2 vowels and 2 consonants, which can be formed from the letters of the word UNIVERSE without repetition is _____.

12. The total number of 4-digit numbers whose greatest common divisor with 54 is 2 , is

13. Let x and y be distinct integers where $1 \leq x \leq 25$ and $1 \leq y \leq 25$. Then, the number of ways of choosing x and y, such that $x+y$ is divisible by 5 , is _____ .

14. The students $S_1, S_2, \ldots, S_{10}$ are to be divided into 3 groups $A,\ B$ and C such that each group has at least one student and the group C has at most 3 students. Then the total number of possibilities of forming such groups is _____.

15. Consider three boxes, each containing 10 balls labelled $1,\ 2,\ \ldots.,\ 10$. Suppose one ball is randomly drawn from each of the boxes. Denote by n_i, the label of the ball drawn from the i^{th} box, $(i = 1,\ 2,\ 3)$. Then, the number of ways in which the balls can be chosen such that $n_1 < n_2 < n_3$ is :
(1) 240
(2) 82
(3) 120
(4) 164

16. The total number of positive integral solutions $(x,\ y,\ z)$ such that $xyz = 24$ is :
(1) 45
(2) 30
(3) 36
(4) 24

17. The total number of $3-$digit numbers whose sum of digits is 10, is .....

18. The number of ways, in which 5 girls and 7 boys can be seated at a round table so that no two girls sit together is
(1) 720
(2) $126(5!)^2$
(3) $7(360)^2$
(4) $7(720)^2$

19. The sum of all the 4-digit distinct numbers that can be formed with the digits $1,\ 2,\ 2$ and 3 is:
(1) 26664
(2) 122664
(3) 122234
(4) 22264

20. Consider a rectangle $ABCD$ having $5, 6, 7, 9$ points in the interior of the line segments $AB,\ BC,\ CD,\ DA$ respectively. Let α be the number of triangles having these points from different sides as vertices and β be the number of quadrilaterals having these points from different sides as vertices. Then $(\beta - \alpha)$ is equal to
(1) 795
(2) 1173
(3) 1890
(4) 717

21. If all the six digit numbers $x_1x_2x_3x_4x_5x_6$ with $0 < x_1 < x_2 < x_3 < x_4 < x_5 < x_6$ are arranged in the increasing order, then the sum of the digits in the 72^{th} number is _____.

22. The number of 7-digit numbers which are multiples of 11 and are formed using all the digits $1, 2, 3, 4, 5, 7$ and 9 is _____.

23. Let $b_1b_2b_3b_4$ be a 4-element permutation with $b_i \in \{1, 2, 3, \ldots\ldots\ldots, 100\}$ for $1 \leq i \leq 4$ and $b_i \neq b_j$ for $i \neq j$, such that either $b_1,\ b_2,\ b_3$ are consecutive integers or b_2, b_3, b_4 are consecutive integers. Then the number of such permutations $b_1b_2b_3b_4$ is equal to _____.

24. Let n be a non-negative integer. Then the number of divisors of the form $4n + 1$ of the number $(10)^{10} \cdot (11)^{11} \cdot (13)^{13}$ is equal to _____.

25. A natural number has prime factorization given by $n = 2^x3^y5^z$, where y and z are such that $y + z = 5$ and $y^{-1} + z^{-1} = \frac{5}{6}, y > z$. Then the number of odd divisors of n, including 1, is:

(1) 12 (2) 6
(3) 11 (4) $6x$

26. The total number of two digit numbers 'n', such that $3^n + 7^n$ is a multiple of 10 , is ___ .

27. The number of ways to distribute 30 identical candies among four children C_1, C_2, C_3 and C_4 so that C_2 receives atleast 4 and atmost 7 candies, C_3 receives atleast 2 and atmost 6 candies, is equal to

(1) 205 (2) 615
(3) 510 (4) 430

28. The number of ways, 16 identical cubes, of which 11 are blue and rest are red, can be placed in a row so that between any two red cubes there should be at least 2 blue cubes, is _____.

29. In an examination, there are 5 multiple choice questions with 3 choices, out of which exactly one is correct. There are 3 marks for each correct answer, -2 marks for each wrong answer and 0 mark if the question is not attempted. Then, the number of ways a student appearing in the examination gets 5 marks is _____

30. In an examination, 5 students have been allotted their seats as per their roll numbers. The number of ways, in which none of the students sits on the allotted seat, is