NUMBERS

PRATYUS PRATYE

AGENDA

Concepts

- Explanation
- Different types of questions asked

Class Exercise

- Practice, Practice & Practice

Class Test/Recap

- Open Discussion

TYPES OF NUMBERS

- Real Number : Any number which we can represented on a number line is called as Real Number.

- Rational Numbers: Number which can be represented in the form of p/q, where q is not equal to Zero. Ex-1,2,-1,0.5, etc

- Irrational Numbers: Number which can't be represented in the form of p/q, where q is not equal to Zero. Ex- $\sqrt{2}, \sqrt{11}, \pi$

TYPES OF NUMBERS

- Integers----→ -3,-2,-1,0,1,2,3….(zero is integer, as integers are whole numbers)
- Natural-----→1,2,3,4,5,6……
- Whole -----→0,1,2,3,4,5……..

Even Numbers-----2,4,6,8,10……

Odd Numbers------1,3,5,7,9,11…..

TYPES OF NUMBERS

Prime Numbers

2,3,5,7,11,13,17,19,23,29,31,37,41,43,47,53,59,61,67,71,73,79,83,89,97,101

Composite Number

4,6,8,9,10,12,14……

Co-Prime Numbers

(2,3), (7,8) etc

Formula for Prime Numbers

6n(+/-)1

PROBLEMS

1. How many prime numbers are there between 10 and 50?
A. 10 B. 11 C. 15 D. 18

2. How many multiples does 23 have between 116 and 253?
A. 6 B. 4 C. 7 D. 5

PROBLEMS

3. Find the value of $3+6\times12/3$

A. 27 B. 24

C. 30 D. 36

4. Let x, y and z be distinct integers. x and y are odd and positive, and z is even and positive. Which one of the following statements cannot be true?

A. $(x - z)^2$ y is even B. $(x - z)$ $(y)^2$ is odd

C. $(x - z)$ y is odd D. $(x - z)^3$ z is even

PROBLEMS

5. The sum of the digits of a three-digit number is 17, and the sum of the squares of its digits is 109. If we subtract 495 from the number, we shall get a number consisting of the same digits written in the reverse order. Find the number. **(TCS-2018)**

A. 773 B. 683 C. 944 D. 863

DIVISIBILITY RULES OF PRIME NUMBERS

Rule for 2^n-- Last "n" digits is divisible by 2^n

Rule for 5^n-- Last "n" digits is divisible by 5^n

Rule for 3 –Sum of digits divisible by 3

Rule for 9 -- Sum of digits divisible by 3

Rule for 11—Sum of digits at odd place – Sum of digits at even place

DIVISIBILITY RULES

7 → Last digit x 2 – remaining digits

11 → Last digit x 1 – remaining digits

13 → Last digit x 4 + remaining digits

17 → Last digit x 5 – remaining digits

19 → Last digit x 2 + remaining digits

DIVISIBILITY RULES

6

12

24

18

35

910

1001

PROBLEMS

6. 5765X4Y is divisible by 9. What is the maximum number of values that X can take for any value of Y?

A. 1 B. 2 C. 3 D. 4

PROBLEMS

7. If 122x, where x is a single digit whole number, is divisible by 4, how many values ‘x’ can have?

A. 1 B. 2 C. 3 D. 4

LCM

Find the LCM of Following

Q1→ 21 and 24

Q2→ 21,24,14,6,12,28,42,84,56,7

PROBLEMS

8. 21. What is the LCM of 12, 16 and 30?

A. 240 B. 160

C. 4 80 D. 120

9. What is the HCF of 39, 117 and 1001?

A. 13 B. 3

C. 39 D. 11

PROBLEMS

10. What is the LCM of the fractions 5/3, 6/7 and 3/5?

A. 15 B. 30/7

C. 60 D. 30

11. If LCM of 36, 42 and x, where x is a natural number, is 252, what is the maximum possible value of x?

A. 252 B. 126

C. 63 D. 93

PROBLEMS

12. If S is the sum of the digits the LCM of 8, 12 and 36, what is the value of S?

A. 12 B. 9

C. 5 D. 11

PROBLEMS

13. If the product of two natural number is 144 and their HCF 4, what is the LCM of the two numbers?

A. 24 B. 36

C. 48 D. 72

PROBLEMS

14. What is the smallest number which when decreased by 8 is divisible by 21, 27, 33, and 55? **(Cognizant – 2018)**

A. 1490 B. 10405 C. 15490 D. 10403

PROBLEMS

15. Three bells chime simultaneously at 12 noon. If they chime at intervals of 4 min, 8 min and 12 min respectively, at what will they chime together the next time?

A. 12: 12 pm B. 12: 24 pm C. 12: 48 pm D. 12: 36 pm

PROBLEMS

16. Six bells commence tolling together and toll at intervals 2,4,6,8,10 and 12 seconds respectively. In 30 minutes how many times they toll together. **(Wipro-2018)**

UNIT DIGIT

2^1	2	3^1	3	7^1	7	8^1	8
2^2	4	3^2	9	7^2	9	8^2	4
2^3	8	3^3	7	7^3	3	8^3	2
2^4	6	3^4	1	7^4	1	8^4	6

4^1	4	9^1	9
4^2	6	9^2	1

Cyclicity of Following	
2,3,7 and 8	4
4 and 9	2
1,5 and 6	1

PROBLEMS

17. What is the unit digit of 3^{33}?
A. 3 B. 9 C. 7 D. 1

PROBLEMS

18. What is the units' digit of $(2^{47} + 7^{13})$

A. 8 B. 7 C. 3 D. 5

PROBLEMS

19. Find the last two digits of the number 7^{44}.

A. 7 B. 23 C. 01 D. 43

NUMBER OF FACTORS

N= a^px b^qx c^r… , where a, b, c are prime factors

- Number of factors of N = (p + 1) × (q + 1) × (r + 1) × …;
- Number of even factors of N = p × (q + 1) × (r + 1) × … if a = 2;
- Number of even factors of N = 0 if a ≠ 2;
- Number of odd factors of N = 1 × (q + 1) × (r + 1) × …
- Number as two distinct factors=(1\2) of all the factors

PROBLEMS

20. Find the number of factors of 900 excluding 1 and itself.

A. 22 B. 25 C. 27 D. 30

PROBLEMS

21. How many factors does N have if N = $2^5 \times 3^8 \times 10^7$?

A. 936 B. 953 C. 432 D. 436

PROBLEMS

22. Find the number of odd factors of $2^4 \times 6^{10} \times 7^3$

A. 61 B. 88 C. 176 D. 44

PROBLEMS

23. Find the number of even factors of 3600.

A. 32 B. 36 C. 40 D. 45

PROBLEMS

24. In how many ways can 1764 be expressed as a product of two of its distinct factors?

A. 13 B. 18 C. 24 D. 36

PROBLEMS

25. Find the sum of all the factors of 3600.

A. 12493 B. 12943 C. 2418 D. 12472

PROBLEMS

26. How many factors of 1080 are divisible by 12?

A. 8 B. 12 C. 14 D. 16

PROBLEMS

27. The number of factors common to 30^{11} and 20^{13} is

A. 144 B. 156 C. 168 D. 136

FIND THE HIGHEST POWER OF FOLLOWING PRIME NUMBERS IN 100!

2

3

5

7

11

13

17

19

FIND THE HIGHEST POWER OF FOLLOWING PRIME NUMBERS IN 100!

4

8

9

27

25

49

121

FIND THE HIGHEST POWER OF FOLLOWING PRIME NUMBERS IN 100!

6

12

24

10

100

910

1001

PROBLEMS

28. How many three-digit numbers are divisible by 4?

A. 224 B. 225 C. 200 D. 223

FIND THE REMAINDER OF FOLLOWING

$$21x22x23x24x25x26x27x28x29x30$$

Find the remainder when you divide the above by

a. 7

b. 14

c. 30

d. 100

e. 260

f. 1001

REMAINDER

21+22+23+24+25+26+27+28+29+30

Find the remainder when you divide the above by

a. 7

b. 25

FIND THE REMAINDER IN FOLLOWING

a. When 51^{203} divided by 7

b. When 41^{965} divided by 7

c. When 41^{462} divided by 7

PROBLEMS

29. A whole number n which when divided by 4 gives 3 as remainder. What will be the remainder when 2n is divided by 4**? (Cognizant – 2018)**

A. 0 B. 1 C. 4 D. 2

PROBLEMS

30. What is the sum of the digit of 7!?

A. 9 B. 8 C. 12 D. 12