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* Quantitave Aptitude *

* Numbers & Algebra [redacted] :-

-> Numbers :-

All positive integers are natural numbers.
e.g. 1, 2, 3, 4, 5 .....

There are infinite natural no. and 1 is the least natural number.

* Types of Numbers :-

1. Prime Numbers :-

A no. who is divisible only 1 and itself, called the prime numbers. Non prime no. are called composite.
Note :- 1 is not a prime number. & not a composite.

*** Ex. :-** 2, 3, 5, 7, 11, 13 .....
these are numbers are called the prime no..

2. Perfect Numbers :-

A no. whose factor sum is equal to a no. digits is called the perfect Numbers.

Ex :- 6

$$\begin{array}{r|l} 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array} = 1 + 3 + 2 = 6$$

Teacher's Signature : .....

3. Armstrong Numbers :-

A ~~Nuber~~ number whose digits cube sum it equal to the exact no., called armstrong numbers.

Ex. :- 153 $\Rightarrow 1^3+5^3+3^3 = 1+125+27 = 153$

4. Plindrom Numbers :-

A number who is written left to right vice-versa right to left is same called the plaindrong numbers.

Ex. :- 1001 , 5225 , 1221 .

5. Happy Numbers :-

A no. whose digit sum square reaches the 1 at last called happy no..

Example :- 19 $\Rightarrow 1^2+9^2 = 82$

$82 \Rightarrow 8^2+2^2 = 68$

$68 \Rightarrow 6^2+8^2 = 100$

$100 \Rightarrow 1^2+0^2+0^2 = 1$

So, 19 is the happy no. because its digits square sum reaches the 1.

* Divisibility Rule :-

A number is divisible by :-

(1) 2, when its unit's digit is even or 0.
(2) 3, when the sum of its is divisible by 3.
(3) 4, When number formed by last two right hands digits it is divisible by 4, or if last two digits are 0's.
(4) 5, When its unit digit is 5 or 0.
(5) 6, When its divisible by 2 and 3 both.
(6) 8, when a number last three digits are divisible by 8 or last 3 digits are 0's.
(7) 9, When sum of its digits is divisible by 9.
(8) 10, When unit's digit is 0.
(9) 11, When the sum of even digit place or odd digit place are divisible by 11.
(10) 12, When it is divisible by 3 and 4 both.

* Numerical Relation :-

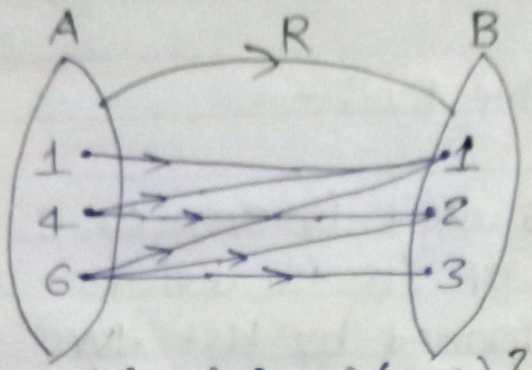
Let A and B be two non-empty sets.

The set of all first elements of ordered pair of R is called "Domain" of R.
The set of all second elements of ordered pair is called "range" of R.

Example:-

If $A = \{1, 4, 6\}$, $B = \{1, 2, 3\}$

construct a relation:-



$R = \{(1,1)(4,2)(6,2)(6,3)\}$

* Types of Relations:-

1. **Reflexive Relation:-** If the relation $(a,a) \in R$ means all element of the set are in the Relation is called reflexive.

2. **Symmetric Relation:-** A relation R is said to be symmetric if $(a,b) \in R \Rightarrow (b,a) \in R$.

3. **Transitive Relation:-** A relation R is said to be transitive if $(a,b) \in R, (b,c) \in R \Rightarrow (a,c) \in R$.

4. **Anti Symmetric Relation:-** A relation R is said to be anti-symmetric if $(a,b) \in R$ and $(b,a) \in R \Rightarrow a = b$.

* HCF AND LCM :-

1. Greatest Common Divisor (GCD) :-

It is the greatest divisor common to two or more given numbers, it is also called HCF (highest common factor).

* Methods of finding HCF :-

(i) By method of factorization :-

Find HCM of 136, 144, 168.

2	136
2	68
2	34
17	17

This type :-
$136 \Rightarrow 2 \times 2 \times 2 \times 17$

$136 \Rightarrow 2 \times 2 \times 2 \times 17 = 2^3 \times 17$
$144 \Rightarrow 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 2^4 \times 3^2$
$168 \Rightarrow 2 \times 2 \times 2 \times 3 \times 7 = 2^3 \times 3 \times 7$

$\boxed{HCM \Rightarrow 2^3 = 8}$

(ii) By division Method :-

Find HCM of 12 and 15.

$\boxed{HCF = 3}$

12) 15 (1
-12
3) 12 (4
-12
00

HCF = 3

2. Least Common Multiple (LCM) :-

LCM of two or more given no. is the least no. which is exactly divisible by each of the given no.

* Methods of finding LCM :-

(i) Method of factorization :-

Find LCM of 136, 144, 168.

$136 \Rightarrow 2 \times 2 \times 2 \times 17 = 2^3 \times 17$
$144 \Rightarrow 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 2^4 \times 3^2$
$168 \Rightarrow 2 \times 2 \times 2 \times 3 \times 7 = 2^3 \times 3 \times 7$

$LCM = 2^4 \times 3^2 \times 17 \times 7 = 17136$

$\boxed{LCM = 17136}$

(ii) Using the formula :-

Product of numbers = HCF × LCM

If two number is given, find their LCM.

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

e.g. => Find LCM of 136, 144

$$LCM = \frac{136 \times 144}{8}$$

$\boxed{LCM = 2448}$

(iii) <u>Short cut Method using factorization :-</u>

Find LCM of 18, 28, 108, 105.

2	18, 28, 108, 105
2	9, 14, 54, 105
3	9, 7, 27, 105
3	3, 7, 9, 35
3	1, 7, 3, 35
5	1, 7, 1, 35
7	1, 7, 1, 7
	1, 1, 1, 1

LCM = $2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7 = 3780$

$\boxed{\text{LCM} = 3780}$

* HCF & LCM of Fractions :-

$$\text{HCF of Fractions} = \frac{\text{HCF of Numerators}}{\text{LCM of Denominators}}$$

$$\text{LCM of Fractions} = \frac{\text{LCM of Numerators}}{\text{HCM of Denominators}}$$

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* Logical Reasoning Ability *

* Reasoning :-

Reasoning is process showing ~~of~~ conclusion or facts. Reasoning is not concerned with some conclusion that has a good chance of being true when facts are true. The only conclusion are acceptable are those that follows loggically correct.

* Types of Reasoning :-

They are basically two types :-

(i) Verbal Reasoning
(ii) Non-verbal Reasoning.

1. Non-Verbal Reasoning :-

Non-verbal Reasoning involve the ability to understand and analyze visual information and solve problem using visual ~~reasoning~~ reasoning. This reasoning test will test your non-verbal reasoning ability as the question present in diagrammatic and pictorial form.

2. Verbal Reasoning :-

Verbal Reasoning tests words, letters and numbers, and require a logical reasoining and a ~~reasonable~~ reasonable knowledge of the English Language.

In this logical reasoning section we have cover only the verbal ~~Reasoning~~ Reasoning part.

* Classification of Verbal Reasoning :-

→ Number series :-

For better understanding, we will classify this into the following categories.

(i) Difference series
(ii) Product series
(iii) Squares / cubes series
(iv) Miscellaneous series
(v) Combination series

(i) Difference series :-

They are furthurs divided into two categories.-
(a) Number series with constant difference.
(b) Number series with increasing or decreasing difference.

Ex:- (i) 1, 4, 7, 10, 13, .. 16
(+3 +3 +3 +3 +3)

So, here we have to see constant diffe is maintaining in the series so we easily find next element that is 16.

(ii) 2, 3, 5, 8, 12, 17, 23, ... 30 ..
(+1 +2 +3 +4 +5 +6 +7)

So, here we have to see the difference is increasing or decreasing so here to find the correct no. is difficult in comparison of consta series. But can analyze the series and find the correct ans that is (23+7) = 30

(iv) Miscellaneous series :-

These are series that do not come under the other patterns and are of general nature but are important and fairly common.

* Ex:- 3, 5, 7, 11, 13.. (17)

Here we have to seeries the prime no. all the no. are prime so the simple number system pattern are not used. So when apply prime no. pattern so, we gusse the final no. that is 17.

(v) Combination series :-

A no. seeries which has come more than one type of (arithmetic) operation performed or more then one series combined togather.

* Ex:- 1, 2, 6, 21, 88.. (445)

In this no. seeries we gusse the 88 is the 4 time & 4 more is the element!

$21 \times 4 + 4 = 88$ just like

$6 \times 3 + 3 = 21$

$2 \times 2 + 2 = 6$

$1 \times 1 + 1 = 2$

So, $88 \times 5 + 5 = 445$.

(ii) Product series :-

A product series is usally a no. series where the terms are obtained by a process of multiplication.

Ex. :- 2, 4, 8, 16, 32, 64, 128

×2 ×2 ×2 ×2 ×2 ×2

Here we have to see the multiplication ~~series~~ ~~se~~ series are show where each element in the series are multiplied with ×2 so we find the correct no. But here we have see different types of multiplication in the questions.

(iii) Squares / cubes series :-

There can be series where all ~~the~~ the terms are related to the squares of numbers or cubes of numbers.

Ex. :- 2, 4, 3, 9, 4, 16, 5, 25

2^2 3^2 4^2 5^2

+1 +1 +1

Here we have to see in the series there are no. alternate difference is 1 & after the no. its square is present, so at end we find missing no in the series that is 25. In this types of question cubes are also included so we identified what is the question want to do.

Success Details >

Runtime: **1 ms**, faster than **35.03%** of Java online submissions for Averag Salary Excluding the Minimum and Maximum Salary.

Memory Usage: **41.7 MB**, less than **6.28%** of Java online submissions fc Average Salary Excluding the Minimum and Maximum Salary.

Next challenges:

Describe the Painting | Number of Black Blocks | Count the Number of Good Partitions

Show off your acceptance:

```java
class Solution {
    public double average(int[] salary) {
        Arrays.sort(salary);
        int n = salary.length;
        double sum = 0.0;
        int count = 0;

        for(int i = 1; i < n - 1; i++){
            sum += salary[i];
            count++;
        }

        return sum / count;
    }
}
```

1030. Matrix Cells in Distance Order

Easy 768 330 Add to List Share

You are given four integers `row`, `cols`, `rCenter`, and `cCenter`. There is a `rows x cols` matrix and you are on the cell with the coordinates `(rCenter, cCenter)`.

Return *the coordinates of all cells in the matrix, sorted by their* ***distance*** *from* `(rCenter, cCenter)` *from the smallest distance to the largest distance*. You may return the answer in **any order** that satisfies this condition.

The **distance** between two cells (r_1, c_1) and (r_2, c_2) is $|r_1 - r_2| + |c_1 - c_2|$.

```java
class Solution {
    public int[][] allCellsDistOrder(int rows, int cols, int rCenter, int cCenter) {
        int[][] ans = new int[rows * cols][2];

        for(int i = 0; i < rows; i++){
            for(int j = 0; j < cols; j++){
                int bno = i * cols + j;
                ans[bno][0] = i;
                ans[bno][1] = j;
            }
        }
        Arrays.sort(ans , (a , b) ->{
            int d1 = Math.abs(a[0] - rCenter) + Math.abs(a[1] - cCenter);
            int d2 = Math.abs(b[0] - rCenter) + Math.abs(b[1] - cCenter);
            return d1 - d2;
        });
        return ans;
    }
}
```

NEW

Example 1:

Your previous code was restored from your local storage. Reset to default