IOSR Journal of Applied Physics (IOSR-JAP)
e-ISSN: 2278-4861. Volume 3, Issue 5 (Mar. - Apr. 2013), PP 29-37
www.iosrjournals.org

Fundamental of Sequence System

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ABSTRACT: *It is a most advantage international level discovery for physics and technology. It solve many problems based on several field of life such as physical education, science, corporate world, engineering, industrial state, space science, mathematics, nuclear science, administration field, pre-planning, management and computer science etc. It is more easy and its representation is so more easy. We can easly provided this system in calculator, computer and many other technology based product.*

Key Word : $\lceil P \rceil_n$, $\lceil P \rceil$, (..), R, $\overset{s}{\lceil} |P_n| \rceil^n$

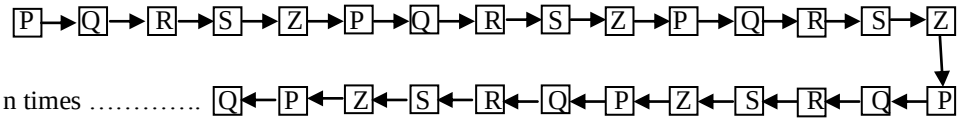
I. Introduction:

The present is time of science and technology.Where physics and mathematics involve there produce technology. So it is a creation of technology. Right now we solve many problems by using plus, minus, multiplication, sin, cos, tan, cot, sec, cosec, calculus, statics, mechanism, integer, root, equation, matrix, determinant, log and many other formulae and theorem. It can be used to provent duplicasy. The sequence system is a fundamental theory to develop science, engineering and technology as well as mathematics.

II. Description:

1. Concept Of Sequence System:-

1.1 Consider a system, organised through any regular process and it's happen again and again with something other differences in any sequence, during the process, as follows



Then, it can be represented as

$$S\overset{n}{\lceil}_{A_{(P,S,5)}}$$ where every 5^{th} step of this process is Z.

Here, consider every step as a process and P to Z as a group.**The above is known as sequence system**.

The sequence system is a Managing Director, For status of any step & many other information, we will be used remainder theory-

We know that if,

X ÷ Y = Z , then X = Y x Z
Where X = Dividend
Y = Divisor
Z = quotient

But if X ÷ Y ≠ Z then

X ÷ Y = Z..R where Z is quotient and R is remainder.

X ÷ Y = Z..R will be known as remainder theorem.

And read as – X divided by Y or X upon Y is equal to Z remainder R, and the symbol "**(..)**" denoted as **remainder.**

Rules-

For status of the process, we will be used remainder theory as following manners as the rules -

When the step, whose we required the status is divided by total number of step under a group as described sequence, then the process –

quotients contains no remainder,
quotient = group number
quotient contain any remainder,

quoitent+1 = group number

And for status of the step of process-

If remainder is 1, then the step will be P.
If remainder is 2, then the step will be Q.
If remainder is 3, then the step will be R.
If remainder is 4, then the step will be S.
If remainder is 0, then the step will be Z.

Now, consider P to Z as a group. To find out the status of 15^{th} and 19^{th} step
Given that, Total number of step under group = 5, then by using remainder theory–

$15 \div 5 = 3..0$

We know that if quotient contains no remainder then,

group number = quotient

so, group number = 3,

Here remainder is zero so step will Z.
Hence the 15^{th} step will be under group number 3 and status of kinds of process will be Z.
For status of step number 19,

$19 \div 5 = 3..4$

We know that if quotient contains any remainder then,

group number = quotient + 1

so, group number = 3+1= 4

Hence the step number 19^{th} exist in group number 4 and type will be S.

II. Fundamental of Sequence System

2.1 Fundamental-1

To manufacture a product of 150 litre Z,50 litre solution (A)diluted with 60 litre solution (B)to produce solution 110 litre (C), now it is heated upto 80^o C, the solution 70 litre D is prepared, now it is diluted with 30 litre solution E, the 100 litre solution of F is occurred next it is freezited upto – 2^o C with a solid G (50 kgs) to occure H, it produce products I (150 ltre) , now it is sealed and packed to sell in market. There some destroy material are occurred which collect in a container(J). The process is completed and a product Z (150 ltre) will be ready to sport. The whole process completed in 11 steps its process can be represented on paper as a-

$$\prod_{P_{(A,J,11)}}^{s\ \ n}$$

Where P shows process & s shows that every 11^{th} step of this process is Z.

This is a process of production for one unit Z. For more production it is done again and again as following-

$A \rightarrow B \rightarrow C \rightarrow D \rightarrow E \rightarrow F \rightarrow G \rightarrow H \rightarrow I \rightarrow J \rightarrow Z \rightarrow A \rightarrow B \rightarrow C \rightarrow D \rightarrow E \rightarrow F \rightarrow G \rightarrow H \rightarrow I \rightarrow J \rightarrow Z$……..n times

2.2 Fundamental-2

If a system is work done in the form of

$P_1 \rightarrow P_2 \rightarrow P_3 \rightarrow P_4 \rightarrow P_5 \rightarrow P_6 \rightarrow P_7 \rightarrow P_8 \rightarrow P_9 \rightarrow P_{10} \rightarrow P_{11} \rightarrow P_{12} \rightarrow P_{13} \rightarrow P_{14}$…..…….n times $= \prod_{n=1}^{n} P_n$

2.3 Fundamental-3

If a system is work done in the form of

$P_1 \rightarrow P_2 \rightarrow P_3 \rightarrow P_4 \rightarrow X \rightarrow P_6 \rightarrow P_7 \rightarrow P_8 \rightarrow P_9 \rightarrow X \rightarrow P_{11} \rightarrow P_{12} \rightarrow P_{13} \rightarrow P_{14}$…..…….n times $= \prod_{n=1}^{s\ \ n} P_n$

S shows that every 5^{th} step of this process is X.

2.4 Fundamental-4

$x_1, x_2, x_3, P, x_5, x_6, x_7, P, x_9, x_{10}, x_{11}, P, x_{13}, x_{14}, x_{15}, P, x_{17}, x_{18}, x_{19}, P, x_{21}$ …… n times= $\prod_{n=1}^{s\ \ n} x_n$

S shows that every 4^{th} term of this process is P.

2.5 Fundamental-5

$2<4<6<8<10<12<14$……..n times $= \prod_{x=1}^{n} (< 2X)$

2.6 Fundamental-6

n times ……80>70>60>50>40>30>20>10 = $\left(>\right)_{x=1}^{n} 10X$

2.7 Fundamental-7

2-4+6-8+10-12+…… n times = $\left(\pm\right)_{x=1}^{n} 2X$

2.8 Fundamental -8

3.6+9.12+15.18+21.24+……n times = $\left(\div\right)_{x=1}^{n} 3X$

2.9 Fundamental-9:- Matrix/Determinate type

A	A	A	A	A	A	A	A	A	A
A	A	A	A	A	A	A	A	A	A
A	A	A	A	A	A	A	A	A	A
A	A	A	A	A	A	A	A	A	A
..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..

$= \left(\right)^{n} |A|_{10}$

2.10 Fundamental-10

A	A	A	A	A	P	A	A	A	A
A	P	A	A	A	A	A	P	A	A
A	A	A	P	A	A	A	A	A	P
A	A	A	A	P	A	A	A	A	A
..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..

$= \left(\right)^{s\,n} |A|_{10}$

S shows that every 6^{th} term of this system is P.

2.11 Fundamental-11

P_1	P_6	P_{11} ……..
P_2	P_7	P_{12} ……..
P_3	P_8	P_{13} ……..
P_4	P_9	P_{14} ……..
P_5	P_{10}	P_{15} ……..

$= \left(\right)_{n=1}^{s\,n} |P_n|_{(1,n,5)}$

2.12 Fundamental -12

If there is a system

P_1	P_2	P_3	P_4	P_5	P_1	P_2	P_3	P_4	P_5
P_1	P_2	P_3	P_4	P_5	P_1	P_2	P_3	P_4	P_5
P_1	P_2	P_3	P_4	P_5	P_1	P_2	P_3	P_4	P_5
P_1	P_2	P_3	P_4	P_5	P_1	P_2	P_3	P_4	P_5
..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..

Consider P_1, P_2, P_3, P_4, P_5 as a group organized in 10 row.
Then under sequence system it can be written as.

$$\left(\right)^{n} |P|_{(1,5,10)}$$

For status of group and kind of member –

Applying remainder theory,
If any term more than 5 divided by 5, then
When quotients have no remainder then the quotient will be group number
When quotient have any remainder then the quotient+1 will be group number, and

If remainder is 1 the step will be P_1
If remainder is 2 the step will be P_2
If remainder is 3 the step will be P_3
If remainder is 4 the step will be P_4
If remainder is 0 the step will be P_5

For row-

If any term more than 10 divided by 10 then –
If quotients have no remainder the quotient will be column number.
If quotient have any remainder the (32uotient+1) will be column number.

2.13 Fundamental -13

If any system organized as –

X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8
X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}
X_{17}	X_{18}	X_{18}	X_{19}	X_{21}	X_{22}	X_{23}	X_{24}
..	..	..	..	..	..	..	..

Then under sequence system it can be written as

$$\bigcirc_{n=1}^{n} | X_n | (1,n,8)$$

For column

Applying remainder theory,
When any term more than 8 divided by 8 then –
If quotients have no remainder the quotient will be column number.
If quotient have any remainder the (quoitent+1) will be column number.

2.14 Fundamental -14

If any system organized as –

X_1	X_4	X_7	X_{10}	X_{13}	X_{16}	X_{19}	X_{22}	.....
X_2	X_5	X_8	X_{11}	X_{14}	X_{17}	X_{20}	X_{23}	.....
X_3	X_6	X_9	X_{12}	X_{15}	X_{18}	X_{21}	X_{24}	.....

Then under sequence system it can be written as

$$\bigcirc_{(1,n,3)}^{n} | X_n |$$

For row

Applying remainder theory,
When any term more than 3 divided by 3 then –
If quotients have no remainder the quotient will be row number.
If quotient have any remainder the (quoitent+1) will be row number.

III. Application

3.1 Physics

3.1.1 Radio activity : The process by which a nucleus of an unstable atom loses energy by emitting particles of ionizing radiation. A material that spontaneously emits this kind of radiation which include the emission of energetic α -particle, β -particle and γ -particle, consider as radio activity.

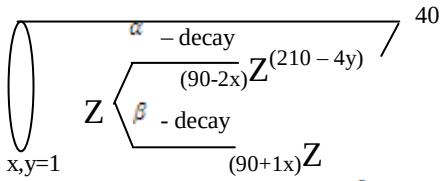
α , β , γ decay mean loses of energies. When –

One α particle decay -
loss of atomic number 2.
loss of atomic mass number 4.

One β , particle decay-
increase atomic number 1
increase atomic mass number zero.

If Z is a atom contain atomic mass number 210 and atomic number 90.

then under sequence system it can be generally shows as –



Show the general formof α, β – decay.

If we have find out the status after 8 α , β decay, then

It is given that,

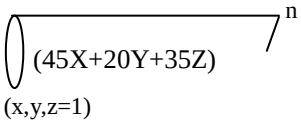
$$x,y = 8$$

$$_{(90-2x)}Z^{210-4y} = {}_{(90-16)}Z^{210-32} = {}_{74}Z^{178}$$

After 8 α , β -decay the atom will be contains atomic number 74 and atomic mass number 178.

3.2 Industrial state –

Consider A is product of 100 gm. per piece. To manufactured it's 45gmX, 20gmY and 35gmZ material are used. Find out the total material used for 200 piece.This whole process can be written as –



Here 45X+20Y+35Z is not an equation

For 200 piece-

$$X,Y,Z=200$$

So, 45X+20Y+35Z is,

X=45 x200=9000

Y=20 x200=4000

Z=35 x200=7000

Total material used for 200 piece =45 x200+20 x200 +35 x200 =20000 gm =20 Kg

Hence 20Kg material used for 200 piece

3.3 In corporate world (To provant duplicasy)

A manufacturing company launches your product in market, To prevent duplicity we used coding system as –

Batch No.	01															
Lot No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Product Code	D	A	B	P	Q	C	R	S	D	A	B	P	Q	C	R	S

.

Batch No.	02															
Lot No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Product Code	D	A	B	P	Q	C	R	S	D	A	B	P	Q	C	R	S

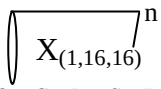
Batch No.	03															
Lot No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Product Code	D	A	B	P	Q	C	R	S	D	A	B	P	Q	C	R	S

……..

……..

Find out the product code and batch number of lot number 453 and 640.

Sol^n :- Under sequence system with use of remainder theory, we write it.



Where X is a process organized such that X=D→A→B→P→Q→C→R→S→D→A→B→P→Q→C→R→S in sequence consider as a group.

For the Batch No. and lot code no. 453

453 ÷ 16= 28..5, so the lot number 453 is product of batch no 28 and lot code is Q.

3.4 Engineering & Technology

3.4.1 Example – The railway department prepare of a project to make up 100 km electric root with the help of 10,000 pole such as every five pole is master pole and all other pole is as general pole.
Find out group and type of 6372^{th} , 7575^{th} , 8387^{th} pole, considering 1 to 5 pole as a group.

Sol^{n}- Under sequence system with use of remainder theory, it can be written as –

$$A , A , A , A , P , A , A , A , A , Z , \ldots\ldots 1000 = \overset{S}{\left(X_{(A,A,5)} \right)}^{1000}$$

X : X = A , A , A , A , Z in sequence, S show every five poles as a master pole.

There are total number of member under group = 5

Status of 6372^{th} pole -

6372 ÷ 5= 1274..2

When quotient have any remainder group = quotient + 1

group = 1274 + 1

= 1275

Hence the 6372^{th} pole will be under group 1275 and 2^{nd} pole (2^{nd} pole is A)

For status of 7575^{th} pole,

7575 ÷ 5 = 1515..0

When quotient have no remainder.

The group = quotient

hence 7575^{th} pole is the member of group 1515^{th} and it is master pole Z.

For status of 8387^{th} term

8387 ÷ 5 = 1235..2

When quotient contains any remainder then(qoitent+1) is the group number, so

Group number = 1235+1

= 1236

Hence, 8387^{th} pole is member of 1236 it will be 2^{nd} pole.

3.4.2 Engineering & Technology

If there is a system contains many step of process such as $x_1, x_2, x_3 , x_4 , x_5 , x_6 , x_7 , x_8 , x_9 , x_{10} , P, x_1, x_2, x_3 , x_4 , x_5 , x_6 , x_7 , x_8 , x_9 , x_{10,} P, x_1, x_2, x_3 , x_4 , x_5 , x_6 , x_7 , x_8 , x_9 , x_{10,} P\, x_1, x_2, x_3 , x_4 , x_5 , x_6 , x_7 , x_8 , x_9 , \ldots .n$
Whose every 11^{th} step is P as a head then this system can be represented as –

$$\overset{S}{\left(x_{(1,\,10,11)} \right)}^{n}$$

where x is a system such that $x = x_1, x_2, x_3 , x_4 , x_5 , x_6 , x_7 , x_8 , x_9 , x_{10,} Z$ consider as a group. Now find out the status of step of process 25^{th} and 35^{th} .

Solution for status of member number 25,

25 ÷ 11 = 2..3

We know that if quotient contains any remainder,

group number = quotient + 1

group number = 2+1

group number = 3

Here remainder 3. So, group will be 3 & Type of process is x_3.

Hence 25^{th} member exist group number 3 and member will x3

For Status of member number 33^{th}

33 ÷ 11 = 3..0

We know that if quotient contains no remainder

Group number = quotient

Groupnumber = 3

Here remainder zero. So, group will be 3 & Type of process is Z.

3.4.3 Engineering & Technology

Consider a series – 2, 4, 6, 8, - 10, 12, 14, 16, 18, - 20, …… n times and it'^{s} every 5^{th} term will be minus figure Now find out its 432^{th} and 620^{th} term.

Sol^{n} :

$$\overset{S}{\underset{X=1}{\left(\right)}}\ \overline{2X}^{\,n}$$

Where s shows that every 5^{th} term of this system is as minus term.

For 432^{th} term using remainder concept.
432 ÷ 5 = 86..2 there is remainder two. So, it is not minus figure.
Therefore, the position of 432^{th} term will be.
given X = 432
So, 2X = 432 X 2 = 864
hence it 432^{th} terms will be 864.
For 620^{th} term
620 ÷ 5 = 124..0
here remainder is zero hence it is under minus figure.
given that X = 620
So. 2X = 620X2 = 1240
hence the 620^{th} term will be (–1240).

3.5 Distance, speed and time:-

A Train have contained speed 80 km/hour. Find out the distance after 8 hour?
Sol^n: Under sequence system it can be written as –

$$\underset{x=1}{\left(\right)}\ \overline{80X}^{\,n}$$

given that,

X = 8 then,
80 x 8 = 640 km
The train have gone 640 Km after 8 hour.

3.6 Administration field

A university declares your annual examination. The seating plan make up as – there are 16 rooms, 50 students in every room, 10 students in every column, total student are 768 as given below –

1	X_1	X_1	X_1	X_1	X_1
2	Y_3	Y_3	Y_3	Y_3	Y_3
3	X_2	X_2	X_2	X_2	X_2
4	Y_1	Y_1	Y_1	Y_1	Y_1
5	X_3	X_3	X_3	X_3	X_3
6	Y_2	Y_2	Y_2	Y_2	Y_2
7	Y_4	Y_4	Y_4	Y_4	Y_4
8	X_5	X_5	X_5	X_5	X_5
9	Y_5	Y_5	Y_5	Y_5	Y_5
10	X_4	X_4	X_4	X_4	X_4

above is status of one room. Find out the status of 437^{th} and 670^{th} student. Here,

1- X_1 mean student of B.Sc. I
2- X_2 mean student of B.Sc. II
3- X_3 mean student of B.Sc. III
4- X_4 mean student of M.Sc. I
5- X_5 mean student of M.Sc. II
6- Y_1 mean student of B.A. I
7- Y_2 mean student of B.A. II
8- Y_3 mean student of B.A. III
9- Y_4 mean student of M.A. I
10- Y_5 mean student of M.A. II

Sol^n: Under sequence system it can be written as –

$$\left(\right)\ \overline{_{(1,10,5)}|Z|}^{\,768}$$

Z:Z= X_1 ,Y_3, X_2, Y_1,X_3, Y_2, Y_4,X_5, X_4 in sequence under first row.

For status of room, for 437th student.

given that ,

Total number of student in room = 50

hence 437 ÷ 50 = 8..37

There qoitent contain remainder hence (qoitent+1) will be room number.

So, qoitent+1 = 8+1

= 9

therefore student seated in room number 9.

For column status –

There are 10 student in a column, hence.

37 ÷ 10 = 3..7

So,the student seated in column number

qoitent + 1 = 3+1

= 4

Hence the 437th student seated in room number 9, seat number 7th of column 4.

For status of student number 670,

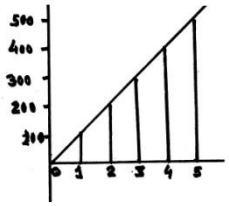
670 ÷ 50 = 13..20

20 ÷ 10 = 2..00

Hence the student status is, room number 14, column number 2, last student.

3.7 Economics

$$\prod_{x=1}^{n} 100X =$$



4. Some other mathematical fundamental & Example-

4.1 If there is a series such as 3, 9, 27, 81, …… n then under sequence system it can be written as -

$$\prod_{x=1}^{n} 3^x$$

Find out the status of 10th terms.

Solution-

given that

x = 10

hence

3^{10} = 3x3x3x3x3x3x3x3x3x3

3^{10} = 59049

Hence the 10th term of this series is 59049.

4.2 A series 2+4+6+8+10+12-14+16+18+20+22 ……n whose7th, 80th, 108th terms under minus figure,it can be written as -

$$\prod_{x=1}^{s} 2X^{n}$$

X:X = 2+4+6+8 ……. n, S shows that its 7th , 80th , 108th term is under minus figure.

Find out the 67th & 80th term of this series

Solution-

For 67th term

1st we check that it is not under 7th, 80th, & 108th term.

Given that

X = 67

Then 2. X = 2X67 = 134

Hence the 67^{th} term of this series is 134
for 80^{th} term.
1^{st} we check that it is under 80^{th} term which is under minus figure
Here given that
X = 80 then
2.X = (-) 2 X 80 = (-) 160
Hence its 80^{th} will be (-160)

4.3 Consider a series 3-5+7-9+11-13+…… n times, find out its 435^{th} and 640^{th} term.

Solution-

Under sequence system it can be written as

$$3\text{-}5\text{+}7\text{-}9\text{+}11\text{-}13\text{+}\ldots\ldots\ldots\ldots \text{ n times} = \left(\begin{matrix}+\\-\end{matrix}\right)\sqrt{}^{n}_{x=1} 2X+1$$

For status of 435^{th} term.

From remainder theorem.

There are two type of member involve is this system

hence

$435 \div 2 = 217..1$

Here remainder is one hence it is under (+) Sign,
So, Given that

$X = 435$

Then, $(2x435+1) = 870+1 = 871$

hence its 435^{th} term will be 871.

For status of 640^{th} term

$640 \div 2 = 320..0$

Here remainder is zero, so it is under (-) sign,
Given that

$X = 640$, So

$(-)\{2. X + 1\} = (-) \{2x640+1\}=(-)1281.$

Hence the 640^{th} term will be (-) 1281.

IV. Conclusion :

This is a new topic for physical science and technology which can be most useful at the time of preparation of any planning, project in the field of engineering and technology. The Fundamental of sequence system is most important.Itis advanatage of several field of life such as science and engineering, to issue currency, to provent duplicasy, to issue mobile recharges, public administration, corporate word, industrial state, mathematics, nuclear physics, space sciences etc. It is more easy to denote and understand.The symbol of remainder "(..)" how so easy to denote & it can be so easly to provide many system.

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