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COMPLEX CHAIN SYSTEM THE FORMULA WITH INCREASING COMMISSION

HIMANSHU*

Krishna College of Higher Education; Ralli, Budhlada-151502, Dist. Mansa (PB), India.

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ABSTRACT

In this paper I describe the formula which is useful to determine the profit or loss in chain business having variable commission. I also describe a formula which is helpful to calculate the profit for a participant according to number of members made participants by him in his chain.

Keyword*-To evaluate total profit or loss, commission,*

INTRODUCTION

I had published a article named Chain System The Formula recently in International Journal Of Mathematics Trends And Technology in this paper we can find profit chain business system but in which the commission remains stable at all the stages.

I had also published a article named Complex Chain System The Formula recently in International Journal Of Science And Research in this paper we can find profit of chain business in which not every participant necessarily make other members participant but the commission remains stable.

I had also published a article named Chain System The Formula With Changeable Commission recently in International Journal Of Scientific Research And Education in which every participant makes his own members in his chain and they get commission can be changed at different stages.

I had also published a article named Complex Chain System The Formula With Changeable Commission recently in International Journal Of Multidisciplinary Research And Development in which not every participant necessarily to make other members in his chain and they get commission can be changed at different stages.

I had also published a article named *Chain* System The Formula With Increasing Commission recently in "International Conference On Recent Trends In Engineering Science And Management " in which which every participant makes his own members in his chain and they get increasing commission can be changed at different stages.

But now in this paper I describe a formula Complex Chain System The Formula With Increasing Commission, for this formula we can find profit of chain business in which not every participant necessarily to make other members in his chain and they get increasing commission can be changed at different stages. This also helps to find that a company is gaining or losing something with the chain business.

The members which participate in chain they can find their profit easily

PROCEDURE OF COMMISSION CHANGE USED IN FORMULA

I will like to clear it with a example that is- Suppose if a person completes a task and gets A% commission of starting price and then if second task is also completed by him then he will get $\left\{\left(\frac{A*P}{100}\right)+A\right\}$ commission(where P is starting price) and $\left\{\left(\frac{A*P}{100}\right)+2A\right\}$ commission for next task and so on.

*Corresponding Author: Himanshu**
Krishna College of Higher Education; Ralli, Budhlada-151502, Dist. Mansa (PB), India.

The formulae are

1. Formula which find the chain's stages through a number of members those participate in the chain system
   - **Total member** $=1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$
   - "G" shows the type of group mean number of members which is to be participated by a member this his chain, that is a member can make only "G" number of members the participant.
   - "G_1" number of member those forward their chain.
   - "n" number of stage.

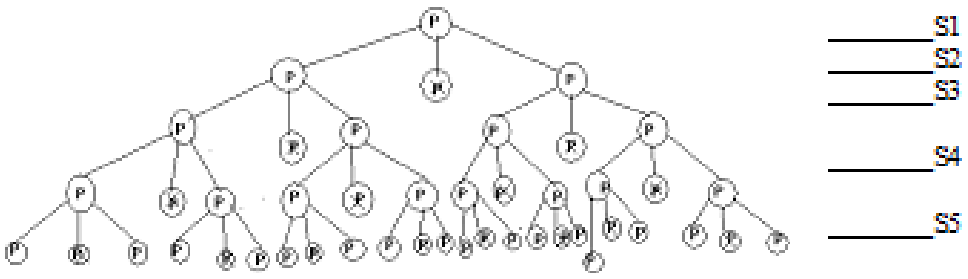
2. Formula for total profit =
$$P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$$
   - "P" shows the starting price mean the starting investment by each member.
   - "C" showing starting commission mean the first profit gained a member after completing his first task.
   - "D" Showing number of percent mean if the first profit gained a member after completing his first task like if he get A% commssion of starting price THEN D =A

3. Formula for evaluating the commission= $(n-1)C+\left[\frac{(n-1)(n-2)}{2}\right]D$

METHODOLOGY

- If every member has put "G" member BUT only "G_1"($G > G_1$) member has to put "G" member toward in their chain AND commission of member can be changed at different stages THEN:-
- Total member $=1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$
- Total profit =
$$P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$$
  Where "P" is starting Price
  "C" is commission
  "n" is no. of Stages
  "G_1" number of member those forward their chain.
- For example:- If every member has put 3 member for his chain then only 2 members of them can forward their chain then find the total profit starting price is 1000 Rs.. Total member is 46 and starting commission is 20% of 1000 Rs.

Ans:



Since Starting Price = 1000 Rs.

Since Starting Commission is 20% of 1000 Rs.

THEN starting commission= 200 Rs.

Profit of S1 = 1000 Rs

Profit of S2 = 3(1000) -200 = 2800 Rs

Profit of S3 = 6(1000)-400-220 = 5380 Rs

Profit of S4 = 12(1000)-800-440-240 = 10520 Rs

Profit of S5 = 24(1000)-1600-880-480-260
= 20780 Rs

Total Profit = 40480 Rs. Ans

By his methodology:

Total member = 46

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$

Since G = 3; G_1 = 2 then $1+\left(\frac{2^{n-1}-1}{2-1}\right)3=46$

- ⇨ $(2^{n-1}-1)3= 45$
- ⇨ $2^{n-1}-1=15$
- ⇨ $2^{n-1} = 16$
- ⇨ $n-1 = 4$
- ⇨ $n = 5$

We know that Total profit = $P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$

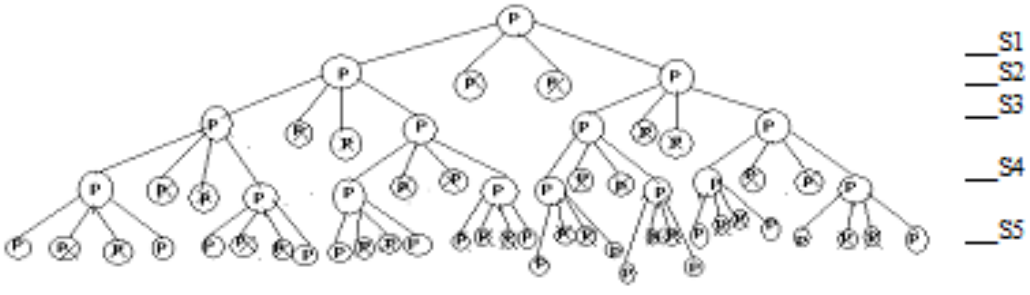
Since P = 1000; G = 3; G_1 = 2; n = 5; C= 200; D=20

Then total profit = $1000+\left(\frac{2^{\,5-1}-1}{2\ -1}\right)(1000)(3)-\left(\frac{2^{\,5}-2}{2-1}\right)\left(\frac{20}{(2-1)^2}+\frac{200}{(2-1)}\right)+(5-1)\left(\frac{(20)(2)}{(2-1)^{\,2}}+\frac{200}{(2-1)}+\frac{(5-2)(20)}{2(2\ -1)}\right)$

= 1000 + (15)(3000) - (30)(220) + (4)(40+200+30)
= 1000 + 45000 – 6600 + 1080
= 40480 Rs Ans …….

- **For example:** If every member has put 4 member for his chain then only 2 members of them can forward their chain then find the total profit starting price is 2000 Rs.. Total member is 61 and starting commission is 10% of 2000 Rs.

Ans:



Since Starting Price = 2000 Rs.

Since Starting Commission is 10% of 2000 Rs.

THEN starting commission= 200 Rs

Profit of S1 = 2000 Rs

Profit of S2 = 8000 - 200 = 7800 Rs

Profit of S3 = 16000 – 400 - 210= 15390 Rs

Profit of S4 = 32000 – 800 – 420 - 220 = 30560 Rs

Profit of S5 = 64000-1600-840-440-230 = 60890 Rs

Total Profit = 116640 Rs.

By his methodology:-

Total member = 61

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$

Since G = 3; G_1 = 2 then $1+\left(\frac{2^{n-1}-1}{2-1}\right)4=61$

- ⇨ $(2^{n-1}-1)4= 60$
- ⇨ $2^{n-1}-1=15$
- ⇨ $2^{n-1} = 16$
- ⇨ $n-1 = 4$
- ⇨ $n = 5$

We know that Total profit =

$$P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$$

Since P = 2000; G = 4; G_1 = 2; n = 5; C= 200; D=10

Then total profit = $P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$

$= 2000+\left(\frac{2^{\,5-1}-1}{2-1}\right)(2000)(4)-\left(\frac{2^5-2}{2-1}\right)\left(\frac{10}{(2-1)^2}+\frac{200}{(2-1)}\right)+(5-1)\left(\frac{(10)2}{(2-1)^2}+\frac{200}{(2-1)}+\frac{(5-2)10}{2(2-1)}\right)$

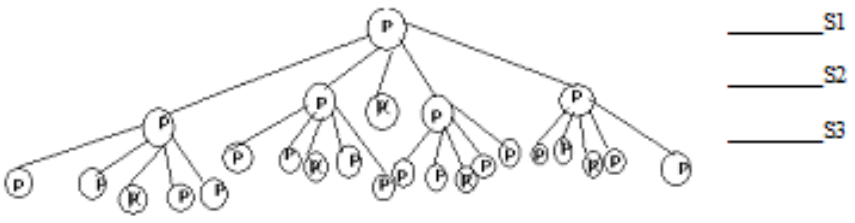
= 2000 + (15)(8000) – (30)(210) + (4)(20+200+15)

= 122000 – 6300 + 940

= 116640 Rs. Ans

- **For example:** If every member has put 5 member for his chain then only 4 members of them can forward their chain then find the total profit starting price is 1000 Rs.. Total member is 26 and starting commission is 10% of 1000 Rs.

Ans:



Since Starting Price = 1000 Rs.

Since Starting Commission is 10% of 1000 Rs.

THEN starting commission= 100 Rs

Profit of S1 = 1000 Rs

Profit of S2 = 5000 - 100 = 4900 Rs

Profit of S3 = 20000 – 400 - 110= 19490 Rs

Total Profit = 25390 Rs.

By his methodology:-

Total member = 26

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$

Since G = 5; G_1 = 4 then $1+\left(\frac{4^{n-1}-1}{4-1}\right)5=26$

$= \left(\frac{4^{n-1}-1}{3}\right)5=26-1$

⇨ $(4^{n-1}-1)3=\frac{3(25)}{5}$

⇨ $4^{n-1}-1=15$

⇨ $4^{n-1}=16$

⇨ $n-1=2$

⇨ $n=3$

We know that Total profit =

$$P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$$

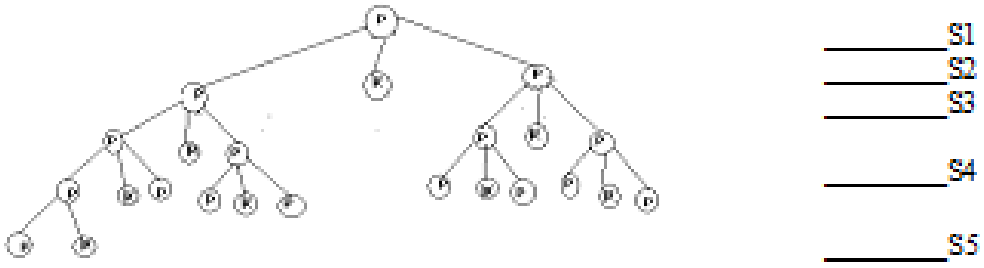
Since P = 1000; G = 5; G_1 = 4; n = 3; C= 100; D=10;

Then total profit $=1000+\left(\frac{4^{3-1}-1}{4-1}\right)(1000)(5)-\left(\frac{4^{\,3}-4}{4\;-1}\right)\left(\frac{10}{(4-1)^2}+\frac{100}{(4-1)}\right)+(3-1)\left(\frac{10(4)}{(4-1)^2}+\frac{100}{(4-1)}+\frac{(3-2)10}{2(4-1)}\right)$

= 1000 + (5)(5000) – (20)(10/9 + 100/3) + 2(40/9 + 100/3 + 5/3)
= 26000 – 200/9 – 2000/3 + 80/9 + 200/3 + 10/3
= 26000-610
= 25390 Rs. Ans

- For example:- If every member has put 3 member for his chain then only 2 members of them can forward their chain then find the total profit starting price is 500 Rs.. Total member is 24 and starting commission is 20% of 500 Rs.

Ans:



Since Starting Price = 500 Rs.

Since Starting Commission is 20% of 500 Rs.

THEN starting commission= 100 Rs

Profit of S1 = 500 Rs

Profit of S2 = 1500 -100 = 1400 Rs

Profit of S3 = 3000-200-120= 2680 Rs

Profit of S4 = 6000-400-240-140= 5220 Rs

Profit of S5 = 1000 Rs

Total Profit = 10800 Rs.

By his methodology:-

Total member = 24

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$

Since G = 3; G_1 = 2 then $1+\left(\frac{2^{n-1}-1}{2-1}\right)3=24$

- ⇨ $(2^{n-1}-1)3 = 24 -1$
- ⇨ $3.2^{n-1} -3= 23$
- ⇨ $3.2^{n-1}= 23+3$
- ⇨ $3.2^{n-1} = 26$

If it does not express then a smaller number is chosen which can be expressed and we get the value of "n"

Like "24" is a smaller number than 26

- ⇨ $24 = 3.2^{n-1}$
- ⇨ n = 4
- ⇨ R is equal to difference between them,
- ⇨ R = 26-24
- ⇨ R = 2

Now some part of profit =

$$P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$$

Since P = 500; G = 3; G_1 = 2; n = 4; C= 100; D=20

Then total profit $=500+\left(\frac{2^{\,4-1}-1}{2\ -1}\right)(500)3-\left(\frac{2^4-2}{2-1}\right)\left(\frac{20}{(2-1)^2}+\frac{100}{(2-1)}\right)+(4-1)\left(\frac{(20)2}{(2-1)^2}+\frac{100}{(2-1)}+\frac{(4-2)20}{2(2\ -1)}\right)$

= 500+(7)(1500)-(14)(20+100)+(3)(40+100+20)
= 11000-1680+480
= 9800 Rs. (1)

Now we find $I = \frac{R}{G_1 - 1}$

Now we arises three cases:-

Case-1: If I < G then (IP) add in (1)

Case-2: If I = G then (IP-C) add in (1)

Case-1: If I > G then find out $\frac{I}{G} = X.$
and arises two cases more

Case-1: If X < G_1 then add (IP-XC) in (1)

Case-2: If X= G_1 then add [IP-XC-(C+D)] in (1)

Case-3: If X≥ G_1 then find out $\frac{X}{G} = Y.$___
Then add [IP-XC-Y(C+D)] in (1)

Now $I = \frac{R}{G_1 - 1}$

Since R = 2; G_1 = 2

Then $I = \frac{2}{2-1} = 2$
I = 2

Since 2 < 3
⇨ I<G

Then by case1:-

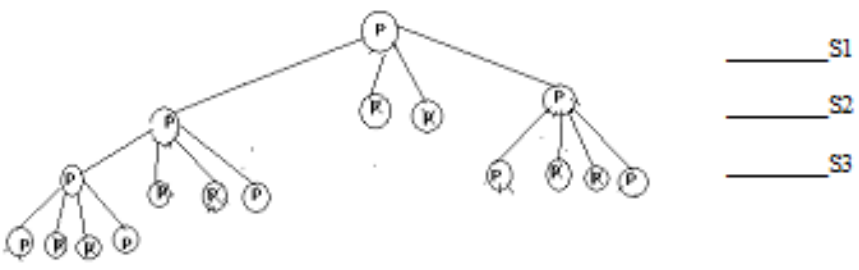
Add IP in……(1)

Mean add 2(500) = 1000 in….(1)

Total profit = 9800 + 1000 = 10800 Rs. Ans

- For example: If every member has put 4 member for his chain then only 2 members of them can forward their chain then find the total profit starting price is 800 Rs.. Total member is 17 and starting commission is 12.5% of 800 Rs.

Ans:



Since Starting Price = 800 Rs.

Since Starting Commission is 25% of 800 Rs.

THEN starting commission = 200 Rs

Profit of S1 = 800 Rs

Profit of S2 = 3200 -200 = 3000 Rs

Profit of S3 = 6400-400-225 = 5775 Rs

Profit of S4 = 3200-200 = 3000 Rs

Total Profit = 12575 Rs.

By his methodology:-

Total member = 17

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$

Since G = 4; G_1 = 2 then $1+\left(\frac{2^{n-1}-1}{2-1}\right)4=17$

- ⇨ 2^{n+1} -4 = 17 -1
- ⇨ 2^{n+1} = 16+4
- ⇨ 2^{n+1}= 20
- ⇨ R=4
- ⇨ 2^{n+1}= 16
- ⇨ n+1=4
- ⇨ n=3

Now some part of profit =

$$P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$$

Since P = 800; G = 4; G_1 = 2; n = 3; C= 200;D=25;

Then total profit = $800+\left(\frac{2^{\,3-1}-1}{2\ \ -1}\right)(800)4-\left(\frac{2^{\,3}-2}{2\ \ -1}\right)\left(\frac{25}{(2-1)^2}+\frac{200}{(2-1)}\right)+(3-1)\left(\frac{25(2)}{(2-1)^2}+\frac{200}{(2-1)}+\frac{(3-2)25}{2(2-1)}\right)$

= 800+(3)(3200)-(6)(25+200)+(2)(50+200+12.5)
= 800+9600-1350+525
= 9575 Rs. (1)

Now we find $I=\frac{R}{G_1-1}$

Since R=4; G_1=2;

$$I=\frac{4}{2-1}$$

I = 4

Since I = G = 4

Then by case II

Add (IP-C) in _____(1)

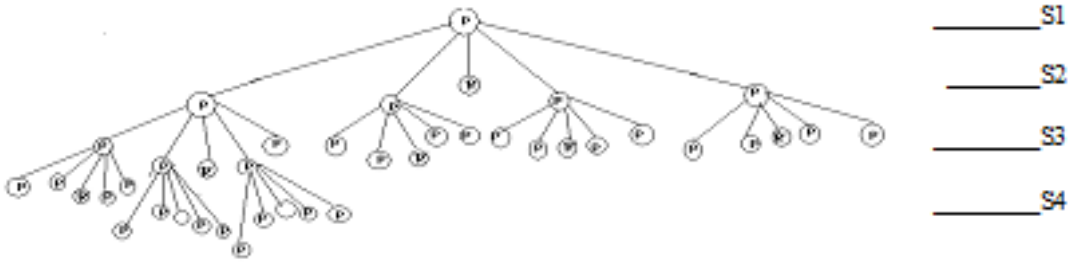
- ⇨ IP-C = 4(800)-200
- ⇨ 3200-200=3000 Rs.

Add (3200) in _____(1)

Total profit = 9575 + 3200
= 12575 Rs. Ans

- For example:- If every member has put 5 member for his chain then only 4 members of them can forward their chain then find the total profit starting price is 700 Rs.. Total member is 41 and starting commission is 30% of 700 Rs.

Ans:



Since Starting Price = 700 Rs.

Since Starting Commission is 30% of 700 Rs.

THEN starting commission= 210 Rs

Profit of S1 = 700 Rs

Profit of S2 = 3500 -210 = 3290 Rs

Profit of S3 = 14000-840-240= 12920 Rs

Profit of S4 = 10500-630= 9870 Rs

Total Profit = 26780 Rs.

By his methodology:-

Total member = 24

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$

Since G = 5; G_1 = 4 then $1+\left(\frac{4^{n-1}-1}{4-1}\right)5=41$

- ⇨ 5.4^{n-1} -5 = 120
- ⇨ 5.4^{n-1} = 125
- ⇨ 5.4^{n-1}= 125
- ⇨ R=4
- ⇨ 5.4^{n-1} = 80
- ⇨ 4^{n-1}=16
- ⇨ n-1=2
- ⇨ n=3

Now some part of profit =

$$P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$$

Since P = 700; G = 5; G_1 = 4; n = 3; C= 210; D=30;

Then total profit = $700+\left(\frac{4^{3-1}-1}{4-1}\right)(700)(5)-\left(\frac{4^{3}-4}{4-1}\right)\left(\frac{30}{(4-1)^2}+\frac{210}{(4-1)}\right)+(3-1)\left(\frac{30(4)}{(4-1)^2}+\frac{210}{(4-1)}+\frac{(3-2)30}{2(4-1)}\right)$

=700+(5)(3500)-(20)(10/3 + 70) +(2)(40/3 + 70 + 5)

=700 + 17500 – 200/3 -1400 +80/3 +150

=16910 Rs. (1)

Now we find $I=\frac{R}{G_1-1}$

Since R = 4; G_1 = 4

Then $I=\frac{45}{4-1}=\frac{45}{3}$

I = 15

Since 15>5

⇨ I > G

Then find $X=\frac{I}{G}$

Now $\frac{I}{G}=\frac{15}{5}=3$

Since X = 3

Since 3 < 4

⇨ X < G_1

Then by case 3.1; add (IP – XC) in _____(1)

Now IP – XC = 15(700) – 3(210)

= 10500 – 630

= 9870 Rs.

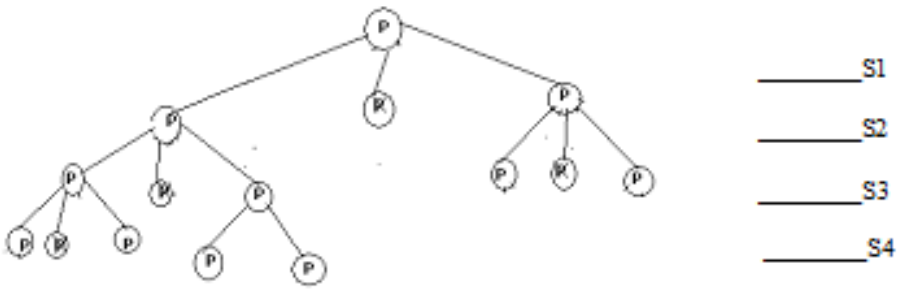
Add in _____(1)

Then total profit = 16910 + 9870

= 26780 Rs. Ans……..

- For example: If every member has put 3 member for his chain then only 2 members of them can forward their chain then find the total profit starting price is 1000 Rs.. Total member is 15 and starting commission is 20% of 1000 Rs.

Ans:



Since Starting Price = 1000 Rs.

Since Starting Commission is 20% of 1000 Rs.

THEN starting commission= 200 Rs

Profit of S1 = 1000 Rs

Profit of S2 = 3000 -200 = 2800 Rs

Profit of S3 = 6000-400-220= 5380 Rs

Profit of S4 = 5000-200= 4800 Rs

Total Profit= 13980 Rs.

By his methodology:-

Total member = 15

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)$G

Since G = 3; G_1 = 2 then $1+\left(\frac{2^{n-1}-1}{2-1}\right)3=15$

- ⇨ 3.2^{n-1} -3 = 14
- ⇨ 3.2^{n-1} = 17
- ⇨ R=5
- ⇨ 3.2^{n-1} = 12
- ⇨ 2^{n-1}=4
- ⇨ n-1=2
- ⇨ n=3

Now some part of profit =

$$P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$$

Since P = 1000; G = 3; G_1 = 2; n = 3; C= 200; D=20;

Then total profit = $1000+\left(\frac{2^{\,3-1}-1}{2^{\,}-1}\right)(1000)3-\left(\frac{2^{\,3}-2}{2^{\,}-1}\right)\left(\frac{20}{(2-1)^2}+\frac{200}{(2-1)}\right)+(3-1)\left(\frac{(20)2}{(2-1)^2}+\frac{200}{(2-1)}+\frac{(3-2)20}{2(2^{\,}-1)}\right)$

= 1000 + 3000 (3) – (6)(220)+(2)(40+200+10)
= 1000+9000-1320+500
= 9180 Rs. (1)

Now $I=\frac{R}{G_1-1}$

Since R = 5; G_1 = 2

Then $I=\frac{5}{2-1}=5$

I = 5

Since 5 > 3

- ⇨ I > G

Then find $X=\frac{I}{G}$

Now $\frac{I}{G} = \frac{5}{3} = 1.6\overline{6}$

So X = 1

⇨ 1 < 2

⇨ $X < G_1$

Then by case 3.1; add (IP – XC) in (1)

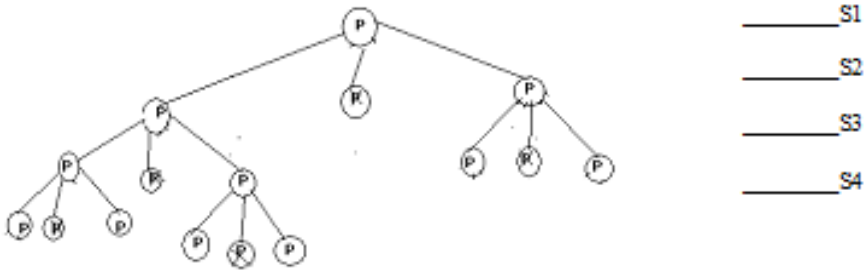
Now IP – XC = 5(1000) – 1(200)
= 5000 – 200
= 4800 Rs.

Add in (1)

Then total profit = 9180 + 4800
=13980 Rs. Ans

- **For example:** If every member has put 3 member for his chain then only 2 members of them can forward their chain then find the total profit starting price is 500 Rs.. Total member is 16 and starting commission is 20% of 500 Rs.

Ans:



Since Starting Price = 500 Rs.

Since Starting Commission is 20% of 500 Rs.

THEN starting commission = 100 Rs

Profit of S1 = 500 Rs

Profit of S2 = 1500 -100 = 1400 Rs

Profit of S3 = 3000-200-120= 2680 Rs

Profit of S4 = 3000-200-120= 2680 Rs

Total Profit = 7260 Rs.

By his methodology:-

Total member = 15

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$

Since G = 3; $G_1 = 2$ then $1+\left(\frac{2^{n-1}-1}{2-1}\right)3 = 16$

⇨ $3.2^{n-1} - 3 = 15$

⇨ $3.2^{n-1} = 18$

⇨ R=6

⇨ $3.2^{n-1} = 12$

⇨ $2^{n-1}=4$
⇨ n-1=2
⇨ n=3

Now some part of profit = $P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$

Since P = 500; G = 3; G_1 = 2; n = 3; C= 100; D=20;

Then total profit = $500+\left(\frac{2^{\,3-1}-1}{2-1}\right)(500)3-\left(\frac{2^{\,3}-2}{2-1}\right)\left(\frac{20}{(2-1)^2}+\frac{100}{(2-1)}\right)+(3-1)\left(\frac{(20)2}{(2-1)^2}+\frac{100}{(2-1)}+\frac{(3-2)20}{2(2-1)}\right)$

= 500 + 1500 (3) – (6)(120) + (2)(40+100+10)
= 500+4500-720+300
= 4580 Rs. (1)

Now $I=\frac{R}{G_1-1}$

Since R = 6; G_1 = 2

Then $I=\frac{6}{2-1}=6$

I = 6

Since 6 > 3
⇨ I > G

Then find $X=\frac{I}{G}$

Now $\frac{I}{G}=\frac{6}{3}=2$

So X = 2
⇨ 2 = X = G_1

Then by case 3.2; add [IP – XC-(C+D)] in (1)

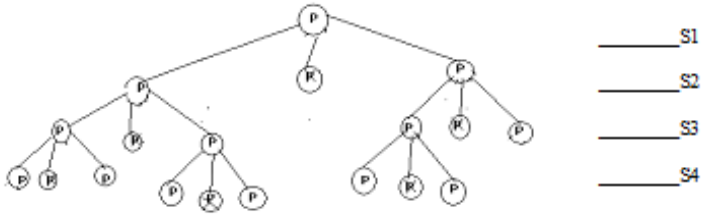
Now [IP – XC-(C+D)] = [6(500) – 2(100) - 120]
= 2680 Rs.

Add in _____(1)

Then total profit = 4580 + 2680
=7260 Rs. Ans

- **For example:** If every member has put 3 member for his chain then only 2 members of them can forward their chain then find the total profit starting price is 600 Rs.. Total member is 19 and starting commission is 10% of 600 Rs.

Ans:



Profit of S1 = 600 Rs

Profit of S2 = 1800 -60 = 1740 Rs

Profit of S3 = 3600-120-70= 3410 Rs

Profit of S4 = 5400-180-70= 5150 Rs

Total Profit = 10900 Rs. Ans

By his methodology:

Total member = 19

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)$G

Since G = 3; G_1 = 2 then $1+\left(\frac{2^{n-1}-1}{2-1}\right)3=19$

- ⇨ 3.2^{n-1} -3 = 18
- ⇨ 3.2^{n-1} = 21
- ⇨ R=9
- ⇨ 3.2^{n-1} = 12
- ⇨ 2^{n-1}=4
- ⇨ n-1=2
- ⇨ n=3

Now some part of profit =

$$P+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)PG-\left(\frac{G_1^{\,n}-G_1}{G_1-1}\right)\left(\frac{D}{(G_1-1)^2}+\frac{C}{(G_1-1)}\right)+(n-1)\left(\frac{DG_1}{(G_1-1)^2}+\frac{C}{(G_1-1)}+\frac{(n-2)D}{2(G_1-1)}\right)$$

Since P = 600; G = 3; G_1 = 2; n = 3; C= 60; D=10;

Then total profit = $600+\left(\frac{2^{\,3-1}-1}{2\ -1}\right)(600)3-\left(\frac{2^{\,3}-2}{2-1}\right)\left(\frac{10}{(2-1)^2}+\frac{60}{(2-1)}\right)+(3-1)\left(\frac{10(2)}{(2-1)^2}+\frac{60}{(2-1)}+\frac{(3-2)10}{2(2\ -1)}\right)$

= 600 + 1800 (3) – (6)(70) + (2)(20+60+5)

= 6000-420+170

= 5750 Rs. (1)

Now $I=\frac{R}{G_1-1}$

Since R = 9; G_1 = 2

Then $I=\frac{9}{2-1}=3$

I = 9

Since 9 > 3

- ⇨ I > G

Then find $X=\frac{I}{G}$

Now $\frac{I}{G}=\frac{9}{3}=3$

So X = 3

⇨ 3>2

⇨ $X > G_1$

Now find out $\frac{X}{G} = Y.$

Now $\frac{3}{3} = 1$

So Y = 1

Since 1 < 2

$Y < G_1$

Then by case 3.3; add [IP – XC-Y(C+D)] in _____(1)

Now [IP – XC-Y(C+D)] = 9(600) – 3(60)-1(70)
= 5400-180-70
= 5150 Rs.

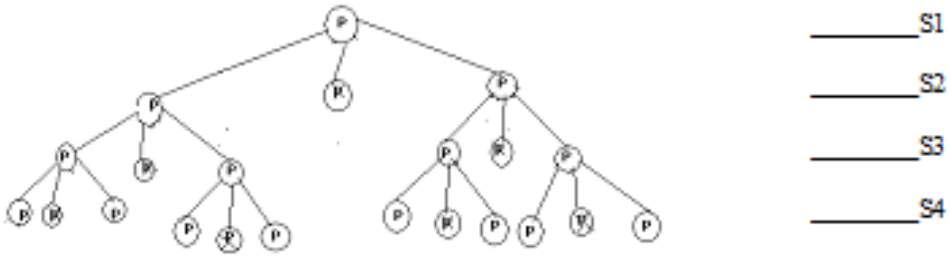
Add in _____(1)

Then total profit = 5750 + 5150
= 10900 Rs. Ans

***For calculating commission* = (n-1)C+** $\left[\frac{(n-1)(n-2)}{2}\right]D$

- For example:- If every member has put 3 member for his chain then only 2 members of them can forward their chain then find the total profit starting price is 1000 Rs.. Total member is 22 and starting commission is 10% of 1000 Rs.

Ans:



Since Starting Price = 1000 Rs.

Since Starting Commission is 10% of 1000 Rs.

THEN starting commission= 100 Rs

He gains commission in S1 = 0 Rs

He gains commission in S2 = 100 Rs

He gains commission in S3 = 110 Rs

He gains commission in S4 = 120 Rs

Total commission = 330 Rs.

By his methodology:-

Total member = 22

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$

Since G = 3; G_1 = 2 then $1+\left(\frac{2^{n-1}-1}{2-1}\right)3=22$

- ⇨ $3.2^{n-1}-3=21$
- ⇨ $3.2^{n-1}=24$
- ⇨ $3.2^{n-1}=3.2^{n-1}$
- ⇨ $n-1=3$
- ⇨ $n=4$

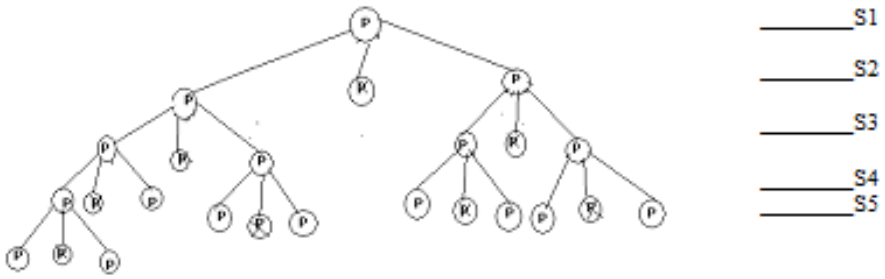
Now total commission = **(n-1)C+** $\left[\frac{(n-1)(n-2)}{2}\right]D$

Since P = 1000; G = 3; G_1 = 2; n = 3; C= 100; D=10

Then total commission = (4-1)100+(3)(10)
= 330 Rs. Ans……..

- For example:- If every member has put 3 member for his chain then only 2 members of them can forward their chain then find the total profit starting price is 500 Rs.. Total member is 25 and starting commission is 20% of 500 Rs.

Ans:



Since Starting Price = 500 Rs.

Since Starting Commission is 20% of 500 Rs.

THEN starting commission= 100 Rs

He gains commission in S1 = 0 Rs

He gains commission in S2 = 100 Rs

He gains commission in S3 = 120 Rs

He gains commission in S4 = 140 Rs

Total commission= 360 Rs.

By his methodology:-

Total member = 22

We know Total member = $1+\left(\frac{G_1^{\,n-1}-1}{G_1-1}\right)G$

Since G = 3; G_1 = 2 then $1+\left(\frac{2^{n-1}-1}{2-1}\right)3=25$

- ⇨ $3.2^{n-1} - 3 = 24$
- ⇨ $3.2^{n-1} = 27$
- ⇨ R = 3
- ⇨ $3.2^{n-1} = 24$
- ⇨ n-1 = 3
- ⇨ n = 4

Now total commission = **(n-1)C+** $\left[\frac{(n-1)(n-2)}{2}\right]D$

Since P = 500; G = 3; G_1 = 2; n = 4; C= 100; D=20;

Then total commission = (3)(100) + (3)(20)
= 660 Rs. Ans

CONCLUSION

With this formula we can very easily find the profit or loss earned by a company with varying commission. It is very useful to Multiple National Marketing Companies which do this type of business and this type of companies can find easily their profit or loss.

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- Miss Seema
  HOD Mathematics Deptt. ,Krishna College Rali dist Mansa.
- Miss Prinka
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  Asst. Prof. Computer Deptt. , Krishna College Rali dist Mansa.

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  Asst. Prof. Computer Deptt. , Krishna College Rali dist Mansa.
- Miss Jaspreet
  Asst. Prof. Computer Deptt. , Krishna College Rali dist Mansa.
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  Asst. Prof. HOD Mathematics Deptt GNC Budhlada.
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  Asst. Prof. Mathematics Deptt GNC Budhlada.
- Mrs. Gurpreet Kaur
  Asst. Prof. Mathematics Deptt GNC Budhlada.
- Miss Nitika Singla
  Asst. Prof Mathematics Deptt. GNC Budhlada.
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