



COMPLEX CHAIN SYSTEM THE FORMULA WITH INCREASING COMMISSION

HIMANSHU*

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

(Received On: 17-10-15; Revised & Accepted On: 31-10-15)

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.
- "G₁" 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 $\underline{D=A}$

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 "G₁" ($G > G_1$) 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

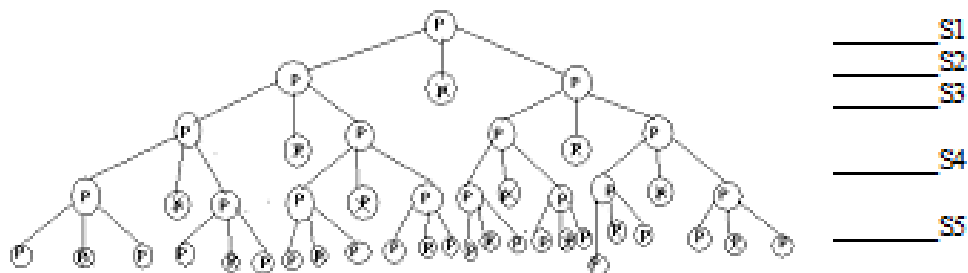
"C" is commission

"n" is no. of Stages

"G₁" 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

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

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

$$\Rightarrow (2^{n-1} - 1)3 = 45$$

$$\Rightarrow 2^{n-1} - 1 = 15$$

$$\Rightarrow 2^{n-1} = 16$$

$$\Rightarrow n - 1 = 4$$

$$\Rightarrow n = 5$$

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

Since P = 1000; G = 3; G₁ = 2; n = 5; C = 200; D = 20

$$\begin{aligned} \text{Then total profit} &= 1000 + \left(\frac{2^{5-1} - 1}{2 - 1} \right) (1000)(3) - \left(\frac{2^5 - 2}{2 - 1} \right) \left(\frac{20}{(2 - 1)^2} + \frac{200}{(2 - 1)} \right) + (5 - 1) \left(\frac{(20)(2)}{(2 - 1)^2} + \frac{200}{(2 - 1)} + \frac{(5 - 2)(20)}{2(2 - 1)} \right) \\ &= 1000 + (15)(3000) - (30)(220) + (4)(40 + 200 + 30) \\ &= 1000 + 45000 - 6600 + 1080 \\ &= 40480 \text{ Rs Ans} \end{aligned}$$

- **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

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

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

$$\Rightarrow (2^{n-1} - 1)4 = 60$$

$$\Rightarrow 2^{n-1} - 1 = 15$$

$$\Rightarrow 2^{n-1} = 16$$

$$\Rightarrow n-1 = 4$$

$$\Rightarrow n = 5$$

We know that Total profit =

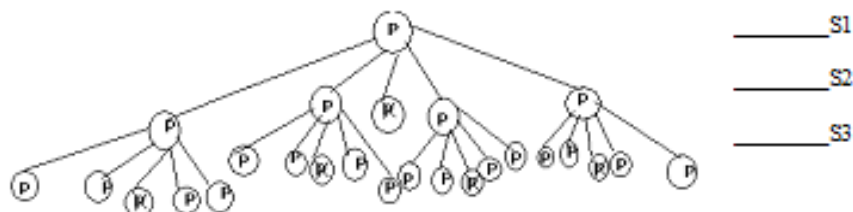
$$P + \left(\frac{G_1^{n-1} - 1}{G_1 - 1} \right) PG - \left(\frac{G_1^n - G_1}{G_1 - 1} \right) \left(\frac{D}{(G_1 - 1)^2} + \frac{C}{(G_1 - 1)} \right) + (n-1) \left(\frac{DG_1}{(G_1 - 1)^2} + \frac{C}{(G_1 - 1)} + \frac{(n-2)D}{2(G_1 - 1)} \right)$$

Since P = 2000; G = 4; G₁ = 2; n = 5; C = 200; D = 10

$$\begin{aligned} \text{Then total profit} &= P + \left(\frac{G_1^{n-1} - 1}{G_1 - 1} \right) PG - \left(\frac{G_1^n - G_1}{G_1 - 1} \right) \left(\frac{D}{(G_1 - 1)^2} + \frac{C}{(G_1 - 1)} \right) + (n-1) \left(\frac{DG_1}{(G_1 - 1)^2} + \frac{C}{(G_1 - 1)} + \frac{(n-2)D}{2(G_1 - 1)} \right) \\ &= 2000 + \left(\frac{2^{5-1} - 1}{2 - 1} \right) (2000)(4) - \left(\frac{2^5 - 2}{2 - 1} \right) \left(\frac{10}{(2-1)^2} + \frac{200}{(2-1)} \right) + (5-1) \left(\frac{(10)2}{(2-1)^2} + \frac{200}{(2-1)} + \frac{(5-2)10}{2(2-1)} \right) \\ &= 2000 + (15)(8000) - (30)(210) + (4)(20+200+15) \\ &= 122000 - 6300 + 940 \\ &= 116640 \text{ Rs. Ans} \end{aligned}$$

- **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

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

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

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

$$\Rightarrow (4^{n-1} - 1)3 = \frac{3(25)}{5}$$

$$\Rightarrow 4^{n-1} - 1 = 15$$

$$\Rightarrow 4^{n-1} = 16$$

$$\Rightarrow n-1 = 2$$

$$\Rightarrow n = 3$$

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; G₁ = 4; n = 3; C = 100; D = 10;

$$\begin{aligned} \text{Then total profit} &= 1000 + \left(\frac{4^{3-1} - 1}{4 - 1} \right) (1000)(5) - \left(\frac{4^3 - 4}{4 - 1} \right) \left(\frac{10}{(4-1)^2} + \frac{100}{(4-1)} \right) + (3-1) \left(\frac{10(4)}{(4-1)^2} + \frac{100}{(4-1)} + \frac{(3-2)10}{2(4-1)} \right) \\ &= 1000 + (5)(5000) - (20)(10/9 + 100/3) + 2(40/9 + 100/3 + 5/3) \\ &= 26000 - 200/9 - 2000/3 + 80/9 + 200/3 + 10/3 \\ &= 26000 - 610 \\ &= 25390 \text{ Rs. Ans} \end{aligned}$$

- 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.

$$\begin{aligned}
 &= 500 + (7)(1500) - (14)(20 + 100) + (3)(40 + 100 + 20) \\
 &= 11000 - 1680 + 480 \\
 &= 9800 \text{ Rs.}
 \end{aligned}$$

(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 $X \geq G_1$ 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 $2 < 3$
 $\Rightarrow I < G$

Then by case1:-

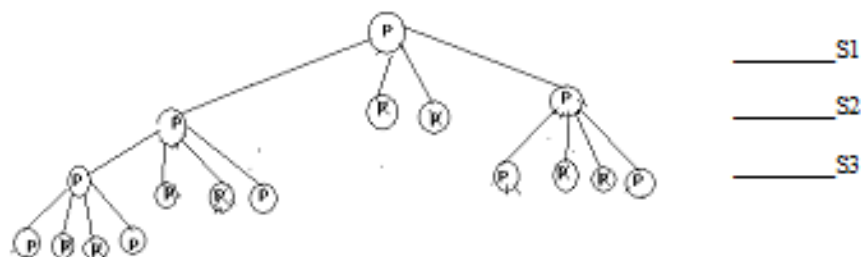
Add IP in.....(1)

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 $1 + \left(\frac{2^{n-1} - 1}{2 - 1} \right) 4 = 17$

$$\Rightarrow 2^{n+1} - 4 = 17 - 1$$

$$\Rightarrow 2^{n+1} = 16 + 4$$

$$\Rightarrow 2^{n+1} = 20$$

$$\Rightarrow R = 4$$

$$\Rightarrow 2^{n+1} = 16$$

$$\Rightarrow n+1 = 4$$

$$\Rightarrow n = 3$$

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

$$\begin{aligned} \text{Then total profit} &= 800 + \left(\frac{2^{3-1} - 1}{2 - 1} \right) (800)4 - \left(\frac{2^3 - 2}{2 - 1} \right) \left(\frac{25}{(2-1)^2} + \frac{200}{(2-1)} \right) + (3-1) \left(\frac{25(2)}{(2-1)^2} + \frac{200}{(2-1)} + \frac{(3-2)25}{2(2-1)} \right) \\ &= 800 + (3)(3200) - (6)(25+200) + (2)(50+200+12.5) \\ &= 800 + 9600 - 1350 + 525 \\ &= 9575 \text{ Rs.} \end{aligned} \tag{1}$$

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

Since $R = 4$; $G_1 = 2$;

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

$$I = 4$$

Since $I = G = 4$

Then by case II

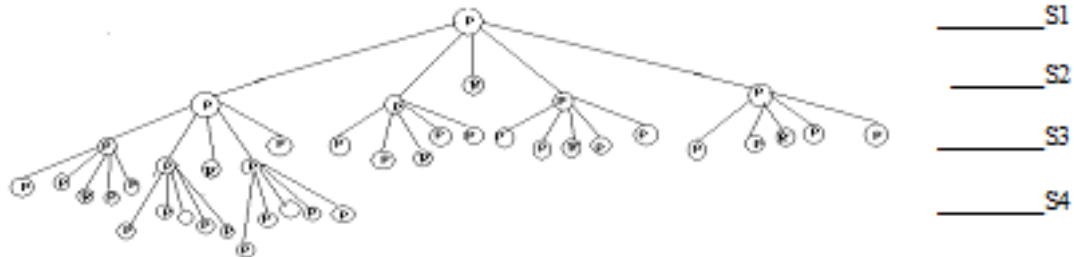
$$\begin{aligned} \text{Add (IP-C) in } & \text{_____ (1)} \\ \Rightarrow & \text{IP-C} = 4(800) - 200 \\ \Rightarrow & 3200 - 200 = 3000 \text{ Rs.} \end{aligned}$$

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 $1 + \left(\frac{4^{n-1} - 1}{4 - 1} \right) 5 = 41$

$$\Rightarrow 5 \cdot 4^{n-1} - 5 = 120$$

$$\Rightarrow 5 \cdot 4^{n-1} = 125$$

$$\Rightarrow 5 \cdot 4^{n-1} = 125$$

$$\Rightarrow R=4$$

$$\Rightarrow 5 \cdot 4^{n-1} = 80$$

$$\Rightarrow 4^{n-1} = 16$$

$$\Rightarrow n-1=2$$

$$\Rightarrow n=3$$

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

$$\begin{aligned}
 \text{Then total profit} &= 700 + \left(\frac{4^{3-1} - 1}{4 - 1} \right) (700)(5) - \left(\frac{4^3 - 4}{4 - 1} \right) \left(\frac{30}{(4-1)^2} + \frac{210}{(4-1)} \right) + (3-1) \left(\frac{30(4)}{(4-1)^2} + \frac{210}{(4-1)} + \frac{(3-2)30}{2(4-1)} \right) \\
 &= 700 + (5)(3500) - (20)(10/3 + 70) + (2)(40/3 + 70 + 5) \\
 &= 700 + 17500 - 200/3 - 1400 + 80/3 + 150 \\
 &= 16910 \text{ Rs.}
 \end{aligned}
 \tag{1}$$

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 $15 > 5$
 $\Rightarrow I > G$

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

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

Since $X = 3$

Since $3 < 4$
 $\Rightarrow X < G_1$

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

$$\begin{aligned}
 \text{Now } IP - XC &= 15(700) - 3(210) \\
 &= 10500 - 630 \\
 &= 9870 \text{ Rs.}
 \end{aligned}$$

Add in _____(1)

$$\begin{aligned}
 \text{Then total profit} &= 16910 + 9870 \\
 &= 26780 \text{ Rs. Ans.....}
 \end{aligned}$$

- 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 $1 + \left(\frac{2^{n-1} - 1}{2 - 1} \right) 3 = 15$

$$\Rightarrow 3 \cdot 2^{n-1} - 3 = 14$$

$$\Rightarrow 3 \cdot 2^{n-1} = 17$$

$$\Rightarrow R=5$$

$$\Rightarrow 3 \cdot 2^{n-1} = 12$$

$$\Rightarrow 2^{n-1} = 4$$

$$\Rightarrow n-1=2$$

$$\Rightarrow n=3$$

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

$$\begin{aligned} \text{Then total profit} &= 1000 + \left(\frac{2^{3-1} - 1}{2 - 1} \right) (1000) 3 - \left(\frac{2^3 - 2}{2 - 1} \right) \left(\frac{20}{(2-1)^2} + \frac{200}{(2-1)} \right) + (3-1) \left(\frac{(20)2}{(2-1)^2} + \frac{200}{(2-1)} + \frac{(3-2)20}{2(2-1)} \right) \\ &= 1000 + 3000 (3) - (6)(220) + (2)(40+200+10) \\ &= 1000+9000-1320+500 \\ &= 9180 \text{ Rs.} \end{aligned} \quad (1)$$

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

Since $R = 5$; $G_1 = 2$

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

$I = 5$

Since $5 > 3$

$$\Rightarrow I > G$$

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

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

So $X = 1$

$$\Rightarrow 1 < 2$$

$$\Rightarrow X < G_1$$

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

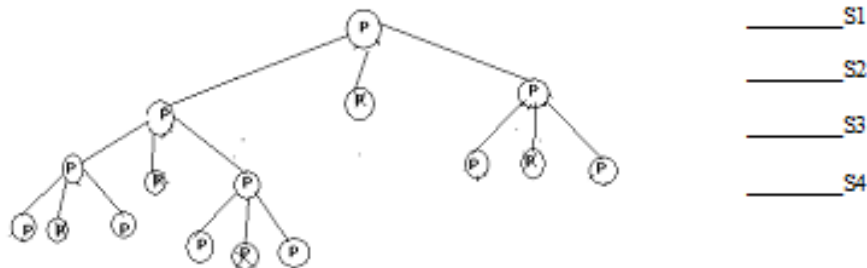
$$\begin{aligned} \text{Now } IP - XC &= 5(1000) - 1(200) \\ &= 5000 - 200 \\ &= 4800 \text{ Rs.} \end{aligned}$$

Add in (1)

$$\begin{aligned} \text{Then total profit} &= 9180 + 4800 \\ &= 13980 \text{ Rs. Ans} \end{aligned}$$

- **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

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

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

$$\Rightarrow 3 \cdot 2^{n-1} - 3 = 15$$

$$\Rightarrow 3 \cdot 2^{n-1} = 18$$

$$\Rightarrow R = 6$$

$$\Rightarrow 3 \cdot 2^{n-1} = 12$$

$$\begin{aligned}\Rightarrow 2^{n-1} &= 4 \\ \Rightarrow n-1 &= 2 \\ \Rightarrow n &= 3\end{aligned}$$

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

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

$$\begin{aligned}\text{Then total profit} &= 500 + \left(\frac{2^{3-1} - 1}{2 - 1} \right) (500)3 - \left(\frac{2^3 - 2}{2 - 1} \right) \left(\frac{20}{(2-1)^2} + \frac{100}{(2-1)} \right) + (3-1) \left(\frac{(20)2}{(2-1)^2} + \frac{100}{(2-1)} + \frac{(3-2)20}{2(2-1)} \right) \\ &= 500 + 1500(3) - (6)(120) + (2)(40+100+10) \\ &= 500 + 4500 - 720 + 300 \\ &= 4580 \text{ Rs.}\end{aligned}\tag{1}$$

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

Since $R = 6$; $G_1 = 2$

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

$I = 6$

Since $6 > 3$

$$\Rightarrow I > G$$

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

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

So $X = 2$

$$\Rightarrow 2 = X = G_1$$

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

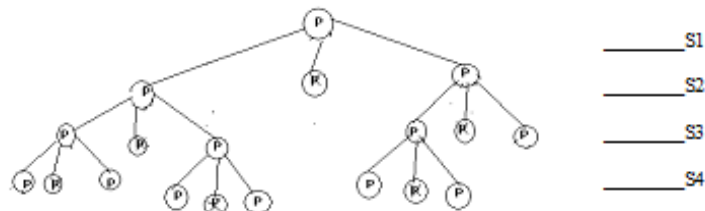
$$\begin{aligned}\text{Now } [IP - XC - (C+D)] &= [6(500) - 2(100) - 120] \\ &= 2680 \text{ Rs.}\end{aligned}$$

Add in _____(1)

$$\begin{aligned}\text{Then total profit} &= 4580 + 2680 \\ &= 7260 \text{ Rs. Ans}\end{aligned}$$

- **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 $1 + \left(\frac{2^{n-1} - 1}{2 - 1} \right) 3 = 19$

$$\Rightarrow 3 \cdot 2^{n-1} - 3 = 18$$

$$\Rightarrow 3 \cdot 2^{n-1} = 21$$

$$\Rightarrow R = 9$$

$$\Rightarrow 3 \cdot 2^{n-1} = 12$$

$$\Rightarrow 2^{n-1} = 4$$

$$\Rightarrow n-1 = 2$$

$$\Rightarrow n = 3$$

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

$$\begin{aligned} \text{Then total profit} &= 600 + \left(\frac{2^{3-1} - 1}{2 - 1} \right) (600)3 - \left(\frac{2^3 - 2}{2 - 1} \right) \left(\frac{10}{(2-1)^2} + \frac{60}{(2-1)} \right) + (3-1) \left(\frac{10(2)}{(2-1)^2} + \frac{60}{(2-1)} + \frac{(3-2)10}{2(2-1)} \right) \\ &= 600 + 1800(3) - (6)(70) + (2)(20+60+5) \\ &= 6000 - 420 + 170 \\ &= 5750 \text{ Rs.} \end{aligned} \quad (1)$$

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

Since $R = 9$; $G_1 = 2$

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

$I = 9$

Since $9 > 3$

$$\Rightarrow I > G$$

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

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

So $X = 3$

$$\Rightarrow 3 > 2$$

$$\Rightarrow X > G_1$$

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

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

So $Y = 1$

Since $1 < 2$

$$Y < G_1$$

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

$$\begin{aligned} \text{Now } [IP - XC - Y(C+D)] &= 9(600) - 3(60) - 1(70) \\ &= 5400 - 180 - 70 \\ &= 5150 \text{ Rs.} \end{aligned}$$

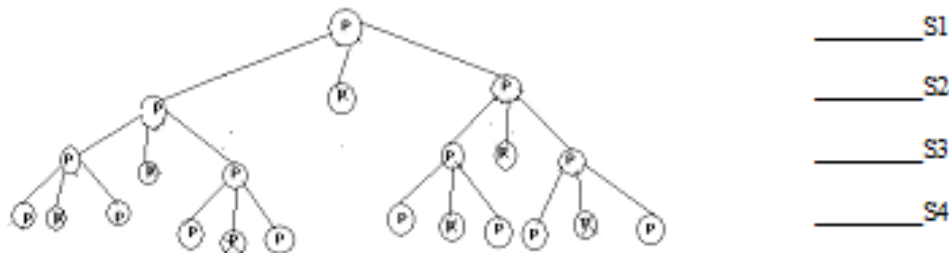
Add in _____(1)

$$\begin{aligned} \text{Then total profit} &= 5750 + 5150 \\ &= 10900 \text{ Rs. Ans} \end{aligned}$$

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

- 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

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

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

$$\Rightarrow 3 \cdot 2^{n-1} - 3 = 21$$

$$\Rightarrow 3 \cdot 2^{n-1} = 24$$

$$\Rightarrow 3 \cdot 2^{n-1} = 3 \cdot 2^{n-1}$$

$$\Rightarrow n-1 = 3$$

$$\Rightarrow n = 4$$

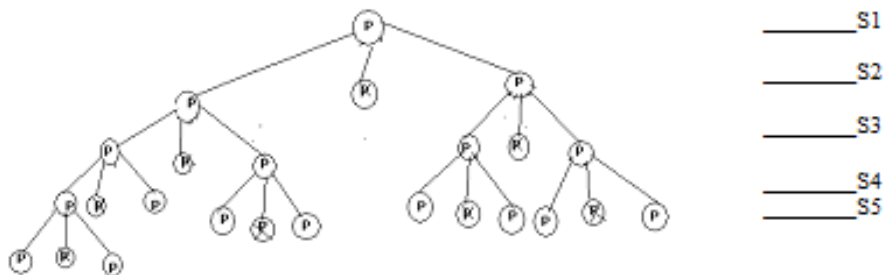
$$\text{Now total commission} = (n-1)C + \left[\frac{(n-1)(n-2)}{2} \right] D$$

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

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

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

$$\begin{aligned} \Rightarrow 3 \cdot 2^{n-1} - 3 &= 24 \\ \Rightarrow 3 \cdot 2^{n-1} &= 27 \\ \Rightarrow R &= 3 \\ \Rightarrow 3 \cdot 2^{n-1} &= 24 \\ \Rightarrow n-1 &= 3 \\ \Rightarrow n &= 4 \end{aligned}$$

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

$$\text{Since } P = 500; G = 3; G_1 = 2; n = 4; C = 100; D = 20;$$

$$\begin{aligned} \text{Then total commission} &= (3)(100) + (3)(20) \\ &= 660 \text{ Rs. Ans} \end{aligned}$$

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.

REFERENCE

- Himanshu “Chain system the formula with increasing commission” in “International Conference On Recent Trends In Engineering Science And Management ”
- Himanshu “Complex Chain system the formula with changeable commission” in “International Journal of Mutidisciplinary Research And Development”
- Himanshu “Chain system the formula with changeable commission” in “International Journal of Scientific And Education”
- Himanshu “Complex Chain system the formula” in “International journal of science and research”
- Himanshu “Chain system the formula” in “International journal of mathematics trends and technology”
- Google

ACKNOWLEDGEMENT

- Dr. Sunil Mehta
HOD Mathematics, Khalsa college Patiala.
- Mr. Anil Jindal
Prof. Bits-Pilani Campus Rajasthan,
- Mr. Rakesh Kumar
Prof. Pbi. Uni. Patiala (PB).
- Mr. Gurmeet Singh
Prof. Mathematics Deptt. Khalsa college Patiala.
- Mrs. Nishu
Prof. Mathematics Deptt. Khalsa college Patiala.
- Mr. Sunil Singla
Principal High Sr. Sec. School Kalipur,
Dist. Mansa.
- Miss Seema
HOD Mathematics Deptt. , Krishna College Rali dist Mansa.
- Miss Prinka
Asst. Prof. Mathematics Deptt. , Krishna College Rali dist Mansa.
- Mr. Sukhpreet Singh
Asst. Prof. Computer Deptt. , Krishna College Rali dist Mansa.

- Mr. Deepak Asija
Asst. Prof. Computer Deptt. , Krishna College Rali dist Mansa.
- Miss Jaspreet
Asst. Prof. Computer Deptt. , Krishna College Rali dist Mansa.
- Mr. Harpreet Singh
Asst. Prof. HOD Mathematics Deptt GNC Budhlada.
- Mr. Happy Kumar
Asst. Prof. Mathematics Deptt GNC Budhlada.
- Mrs. Gurpreet Kaur
Asst. Prof. Mathematics Deptt GNC Budhlada.
- Miss Nitika Singla
Asst. Prof Mathematics Deptt. GNC Budhlada.
- Miss Anita Rani
Mathematics Teacher Govt Girl School Boha Dist Mansa
- Miss Manisha Rani
Teacher Manu Vikika , School Budhlada.

Source of support: Nil, Conflict of interest: None Declared

[Copy right © 2015. This is an Open Access article distributed under the terms of the International Journal of Mathematical Archive (IJMA), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.]