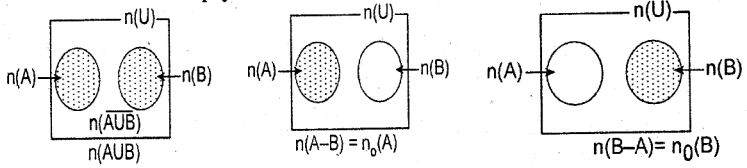
एकाइ (Unit): 1

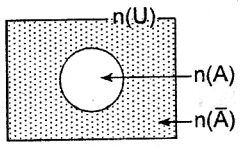
समूह (Sets)

केहि महत्वपूर्ण सूत्रहरू (Some Important formulae)

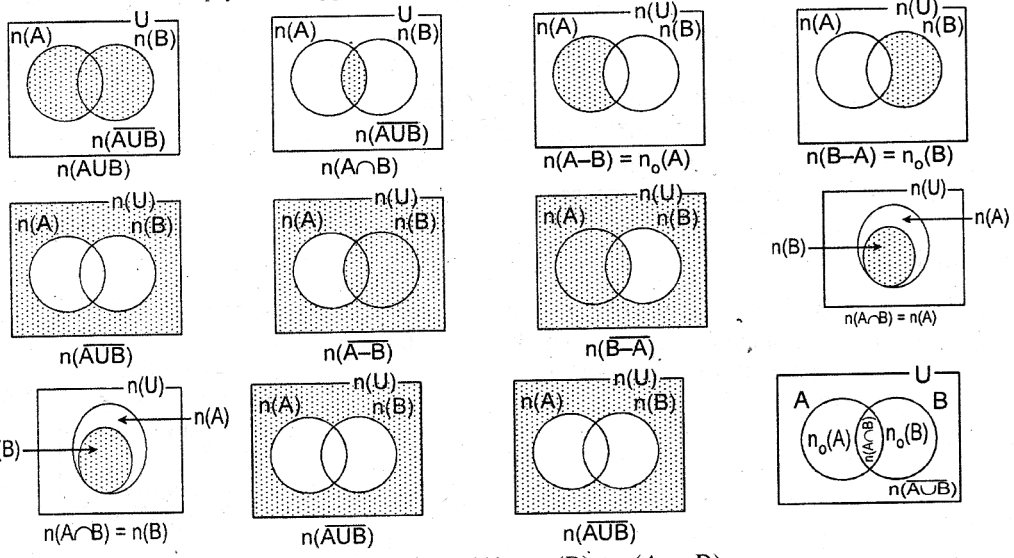
1. यदि A र B सर्वव्यापक समूह U का खाली नभएका उपसमूहहरू भए
   If A and B are non-empty subsets of universal set U.



- $n(A \cup B) = n(A) + n(B)$ $\{\because n(A \cap B) = \phi \text{ (null)}\}$
- $n(\cup) = n(A \cup B) + n(\overline{A \cup B})$
- $n(\cup) = n(A \cup B)$ $\{\because n(\overline{A \cup B}) = \phi \text{ (null)}\}$
- $n(A - B) = no(A)$, $n(B - A) = n_0(B)$
- $n(\cup) = n(A) + n(\overline{A})$



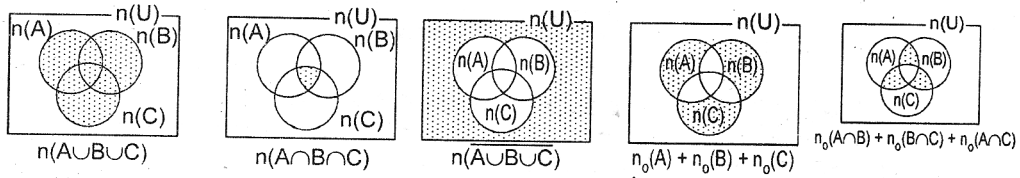
2. यदि A र B सर्वव्यापक समूह U का खाली नभएका खप्टिएका उपसमूहहरू भए
   If A and B are non-empty over lapping subets of universal set U.



- $n(A \cup B) = n_0(A) + n(A \cap B) + n_0(B) = n_0(A) + n_0(B) + n(A \cap B)$
  $n(A \cup B) = n(A)$
- $n_0(A) = n(A) - n(A \cap B)$ $n_0(B) = n(B) - n(A \cap B)$
- $n(A \cup B) = n(A) + n(B) - n$
- $(A \cap B)$
- $n(\cup) = n(A \cup B) + n(\overline{A \cup B})$ if $n(\overline{A \cup B}) = \phi$ (null), then $n(\cup) = n(A \cup B)$
- $n(\overline{A} \cap B) = n(B - A) = n_0(B)$

- $n(A \cap \overline{B}) = n(A - B) = n_0(A)$

3. यदि A, B र C सर्वब्यापक समुहका खाली नभएमा खप्टिएको उपसमूहहरू भए,
If A, B and C are non-empty over lepping subsets of a ceuiversal set U.



- $n(A \cup B \cup C) = n_0(A) + n_0(B) + n_0(C) + n_0(A \cap B) + n_0(B \cap C) + n_0(A \cap C) + n(A \cap B \cap C)$
- $n(A \cup B \cup C) = n(A) + n(B) + n(C)\ n(A \cap B) - n(B \cap C) - n(A \cap C) + n(A \cap B \cap C)$
- $n(\cup) = n(A \cup B \cup C) + n(\overline{A \cup B \cup C})$ if $n(\overline{A \cup B \cup C})$ $= \phi$ (null set) then $n(\cup) = n(A \cup B \cup C)$
- $n(A \cup B \cup C) = n(A \cup B) + n_0(C)$
- $n(A \cup B \cup C) - n(A \cup C) + n_0(B)$

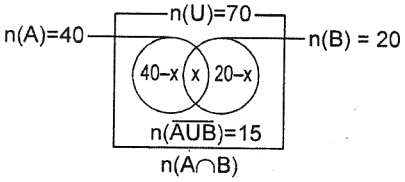
1.1 दुई ओटा समूहमा समिलित समस्याहरू
Problems Based on The Two Variables

Model 1

1. A र B दुई ओटा सर्वब्यापक समूह $\cup$ का उपसमूहहरू हुन, जसमा $n(\cup) = 70\ n(A) = 40 n(B) = 20$ र $n(\overline{A \cup B}) = 15$ भए ।
A and B are two subsets of universal a set $\cup$ in which $n(\cup) = 70\ n(A) = 40\ n(B) = 20\ n(\overline{A \cup B}) = 15$ then.
(i) माथिको तथ्याङ्कालाई भेन चित्रमा प्रस्तुत गर्नुहोस् ।
Show it in a venn diagram.
(ii) $n(A \cap B)$ को मान पत्ता लगाउनुहोस् ।
Find the value $n(A \cap B)$.

Solution:

Here, $n(\cup) = 70\ n(A) = 40\ n(B) = 70$ and $n(\overline{A \cup B}) = 15$ if $n(A \cap B) = x$, from the venn-diagram $n(A \cup B) = 70 - 15 = 55$
Now, $n(A \cup B) = (40 - x) + x + (20 - x)$
or, $55 = 40x + x + 20 - x$
or, $55 = 60 - x$
or, $x = 60 - 55$
$\therefore\ x = 5$
The value of
$\therefore\ n(A \cap B) = 5$



Model 2:

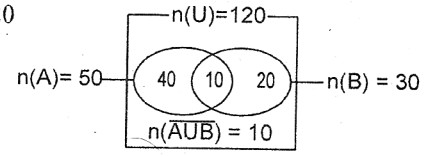
A र B दुईओटा सर्वव्यापक समूह $\cup$ का उपसमूह हुन् जसमा $n(\cup) = 80$, $n(A) = 50$, $n(B) = 30$ र $n(A \cap B) = 10$ छ भने
(i) माथिको तथ्याङ्कलाई भेनचित्रमा प्रस्तुत गर्नुहोस् ।
Show it in a venn-diagram
(ii) $n(\overline{A \cup B})$ को मान निकाल । Find the value of $n(\overline{A \cup B})$

Solution:

Here, A and B are subsets of universal ∪, n (∪) = 80, n (A) = 50
n(B) = 30 n (A ∩ B) = 10
From the venn-diagram n (A ∪ B) = 40 + 10 + 20
∴ n (A ∪ B) = 70

Again n ($\overline{A \cup B}$) = 80 – 70 = 10

∴ The value of n($\overline{A \cup B}$) = 10



Model 3:

100 जना मानिसहरूमा गरिएको एउटा सर्वेक्षणमा 65 जनाले लोक गीत, 55 जानाले आधुनिक गीत र 35 जनाले लोक गीत तथा आधुनिक गीत दुवै मनपराउने पाइयो भने,

In survey of 100 people it was found that 65 like flok songs 55 liked modern songs and 35 liked flok as well as modern songs .

(i) उक्त तथ्यलाई भेन चित्रमा प्रस्तुत गर्नुहोस् । (Sraw the venn – diagram to illustrate this fact.)

(ii) दुवै थरी गीत मन नपराउने कति थिए । (How many people did not it like both songs.)

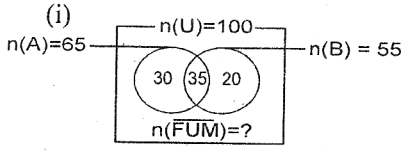
Solution:

Here, Total no. of people n(∪) = 100
No.of people who like flok songs and modern songs, respectively.
Now, n(F) = 65, n(M) = 55 n(F ∩M) = 35
Using , Venn - diagram
n(F ∪ M) = 30 + 35 + 20
∴ n(F ∪ M) = 85

(ii) Now n ($\overline{F \cup M}$) = 100 – 85
∴ n($\overline{F \cup M}$) = 15
People did not like both songs

Number of people who did not like both n ($\overline{F \cup M}$) = 15

(i)



Model4

नेपाल भ्रमण आएका 250 जना पर्यटकहरु मध्ये 40% ले यस अघि नै पोखरा र 30% ले लुम्बिनी भ्रमण गरिसकेका रहेछन् । त्यसपछि 10% ले दुवै ठाउँ भ्रमण गरिसकेका रहेछन् भने

Out of 250 tourists arriving to visit Nepal 40% of them have already visit Pokhara and 30 % visited Lumbini. Also 10% of them have already visited both the place. then

(a) माथिको जानकारीलाई भेन चित्रमा देखाउनुहोस् । (Show the above information in the venn-diagram.)

(b) पोखरा र लुम्बिनी भ्रमण नगर्ने कति जना थिए ? पत्ता लगाउनुहोस् ।
How many tourists had not visited pokhara and lumbini find.

(c) लुम्बिनी मात्र भ्रमण कति जना पर्यटक थिए ? (How many tourist visited lumbini only? Find it.)

Solution:

Here total number of tourists n(∪) = 250
P and L dnotes, who already visited Pokhara and Lumbini respectively.
So, n (p) = 40% = 40% of 250

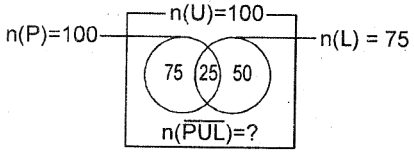
$= \frac{40}{100} \times 250 = 100$

n (L) = 30° = 30% of 250 = $\frac{30}{100} \times 150 = 75$

Then n(P ∩ L) = 10% = 10% of 250 = $\frac{10}{100} \times 250 = 25$

Using venn-diagram
n(P ∪ L) = 75 + 25 + 50 = 150
Now, n ($\overline{P \cup L}$) = 250 – 150 = 100

(i)



Number of tourist had not visited Pokhara and Lumbini

$n(\overline{P \cup L}) = 100$ $n_0(L) = 50$

No, of tourist visited Lumbini only $n_0(L) = 50$

Model 5:

120 जना विद्यार्थीहरूको सर्वेक्षणमा 17 जना न त चिया न त कफि नै पिउने, 88 जना चिया पिउने र 26 जना कफी पिउने पाइयो भने भेनचित्र बनाइ चिया र कफि दुवै पिउने विद्यार्थी संख्या निकाल्नुहोस् ।

In a survey of 120 students it was found that 17 drinks neither tea nor coffee 88 drink tea and 26 drink coffee, By drawing a venn-dragram find out the number of students who drink both tea and coffee.

Solution:

In survey total number of students $n(\cup) = 120$

T and C denotes who drinks tea and coffee, $n(\overline{T \cup C}) = 17$, $n(T) = 88$ $n(C) = 26$

Let who drinks both tea and coffee be $n(T \cap C) = x$

Using venn-diagram $n(T \cup C) = (120 - 17) = 103$

$\therefore$ $n(T \cup C) = (88 - x) + x + (26 - x)$

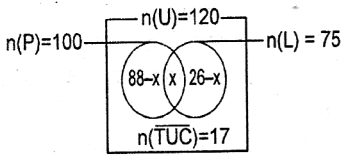
or, $103 = 99 - x + x + 26 - x$

or, $103 = 114 - x$

or, $x = 114 - 103$

$\therefore$ $x = 11$

$\therefore$ No. of students who dirnks both tea and coffee $n(T \cap C) = 11$



Model 6:

115000 विद्यार्थीहरू मध्ये 20% एस.एल.सी. परीक्षामा असफल भए । असफल भएका मध्ये 40% विज्ञानमा मात्र, 35% गणितमामात्र असफल भएछन, तर 5% अरु नै विषयमा असफल भएछन् भने

Out of 115000 students 20% failed in SLC exam. 40% of the falures failed in science only, and 35% in mathematics only. But 5% of them failed in other subject then

(a) कति जना विज्ञान र गणित दुवै विषय असफल भएछन् ? पत्ता लगाउनुहोस् ।
How many failed in both science and mathematis? Find them

(b) माथिको जानकारी भेन चित्रमा देखाउनुहोस् । (Show the above information in a venn-dragram.)

Solution:

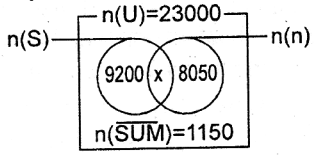
Total no. of failed students $n(\cup) = 20\%$ of $115000 = \frac{20}{100} \times 115000 = 23000$

Let S and M denotes who failed in science and mathematics respectively

$n_0(S) = 40\% = 40\%$ of $23000 = \frac{40}{100} \times 23000 = 9200$

$n_0(m) = 35\% = 35\%$ of $23000 = \frac{35}{100} \times 23000 = 8050$

$n(\overline{S \cup M}) = 5\% = 5\%$ of $23000 = \frac{5}{100} \times 23000 = 1150$



Using formula,

(i) $\therefore$ $n(M \cup S) = n(\cup) - n(\overline{M \cup S}) = 2300 - 1150 = 21850$

Again,

$\therefore$ $n(M \cup S) = n_0(s) + n_0(M) + n(M \cap S)$

or, $21850 = 9200 + 8050 + n(M \cap S)$

or, $21850 = 17250 + n(M \cap S)$

or, $n(M \cap S) = 21850 - 17250$

$\therefore$ $n(M \cup S) = 4600$

Failed on the both subject $n(M \cap S) = 4600$

Model 7:

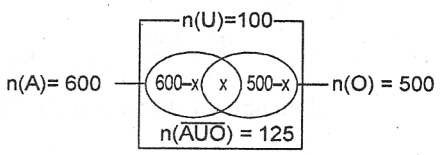
एउटा विद्यालयका 900 जना विद्यार्थीहरू माझ गरिएको एक सर्वेक्षणमा स्याउ मनपराउने 600 जना सुन्तला मन पराउने 500 जना र कुनै पनि मननपराउने 125 जना पाइयो ।

In a survey among the 900 students of a school. It was found that 600 students like apple, 500 liked orange and 125 did not like any fruits.

(i) माथिको तथ्यलाई भेनचित्रमा प्रस्तुत गर्नुहोस् ।
Draw a venn-diagram to illustrate the above

(ii) दुवै फलफूल मनपराउने विद्यार्थीहरूको संख्या पत्ता लगाउनुहोस् ।
Find the number of students who like both fruits.

(iii) स्याउ मात्र मनपराउने विद्यार्थीहरूको संख्या पत्ता लगाउनुहोस् ।
Find the number of students who like only apple.



Solution:

Total number of students $n(\cup) = 900$

Let A and O denote students Who like apple and orange respectively

$n(A) = 600$ $n(O) = 500$ and $n(\overline{A \cup O}) = 125$

If number of students who like both fruits $n(A \cap O) = x$

Using venn-diagram

(ii) $n(A \cup O) = 900 - 125 = 775$

Again $n(A \cup O) = (600 - x) + x + (500 - x)$

or, $775 = 600 - x + x + 500 - x$

or, $775 = 1100 - x$

or, $x = 1100 - 775$

$\therefore \quad x = 325$

Number of students who like both fruits $n(A \cap O) = 325$

(iii) Number of students who like only apple $n_0(A) = 600 - x = 600 - 325 = 275$

Model 8:

एउटा विद्यार्थीको समूहमा गरिएको सर्वेक्षणमा 35% विद्यार्थीहरूले गणित मन पराइएको पाइयो, 30% लेखा र 3000 ले दुवै मन पराइएको पाइयो, भने 50% ले कुनै पनि विषयमा रुचि नलीएको पाइयो भने

In a survey of a group of students it was found that 35% of the students like maths, 30% liked account and 3000 students liked both of them and 50% like none of them.

(i) माथिको तथ्यलाई भेन चित्रमा प्रस्तुत गर्नुहोस् । Draw a venn-diagram to illustrate the above information.

(ii) सर्वेक्षणमा भाग लिएका जम्मा विद्यार्थीहरूको संख्या निकाल्नुहोस् ।
Find the total number of students in the survey.

Solution:

Let the total number of students $n(\cup) = x$

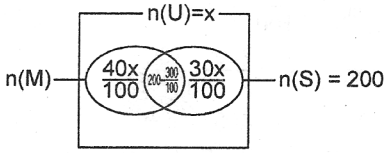
M and A denotes who like mathematics and account respectively, now

$n(M) = 35\% = 35\% \text{ of } x = \frac{35x}{100}$

$n(A) = 30\% = 30\% \text{ of } x = \frac{30x}{100}$

$n(M \cap A) = 3000$

$n(\overline{M \cup A}) = 50\% = 50\% \text{ of } x = \frac{50x}{100}$



(i) Using venn-diagrm

$n(M \cup A) = x - \frac{50x}{100} = \frac{50x}{100}$

$n(M \cup A) = \left(\frac{35x}{100} - 3000\right) + 3000 + \left(\frac{30x}{100} - 3000\right)$

or, $\frac{50x}{100} = \frac{35x}{100} - 3000 + 3000 + \frac{30x}{100} - 3000$

or, $\frac{50x}{100} = \frac{65x}{100} - 3000$

or, $\frac{50x}{100} - \frac{65x}{100} = -3000$

or, $\frac{-15x}{100} = -3000$

or, $x = \frac{3000 \times 100}{15}$ $\therefore x = 20000$

Total number of studnets $n(\cup) = 20000$

Model 9:

एउटा परीक्षामा 40% विद्यार्थी गणितमा मात्र पास भए 30% विद्यार्थी विज्ञानमा मात्र पास भए र 10% विद्यार्थी दुवैमा फेल भए र यदि 200 जना विद्यार्थीहरू विज्ञानमा पास भए भने भेन चित्रको प्रयोग गरेर जम्मा विद्यार्थी संख्या पत्ता लगाउनुहोस् ।

In an examination 40% of students passed in maths only 30%. Passed in science only and 10% students failed in both subjects if 200 students passed in science, find the total number of students by drawing venn-diagram.

Solution:

Let the total number of students $n(\cup) = x$

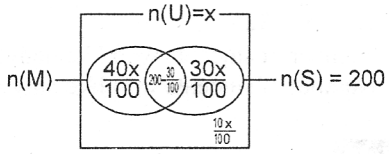
M and S denotes who passed in maths and science repectively

$n_0(M) = 40\% = 40\% \text{ of } x = \frac{40x}{100}$

$n_0(S) = 30\% = 30\% \text{ of } x = \frac{30x}{100}$

$n(S) = 200$

$n(\overline{M \cup S}) = 10\% = 10\% \text{ of } x = \frac{10x}{100}$



Using venn-diagram

$n(M \cap S) = \left(200 - \frac{300x}{100}\right)$

$n(M \cup S) = x - \frac{10x}{100} = \frac{90x}{100}$

Now, $(M \cup S) = \frac{40x}{100} + 200 - \frac{30x}{100} + \frac{30x}{100}$

or, $\frac{90x}{100} - \frac{40x}{100} = 200$

or, $\frac{50x}{100} = 200$

or, $x = \frac{200 \times 100}{50}$

$\therefore \quad x = 400$

Total number of students $n(\cup) = 400$

Model 10:

एउटा सर्वेक्षणमा आधुनिक गीत र लोकगीत मनपराउने मानिसहरूको अनुपात 8:9 पाइयो जसमध्ये 50 जनाले दुवैगीत मन पराए, 40 जनाले लोक गीत मात्र मनपराए र 80 जनाले कुनै पनि गीत मन पराएन भने

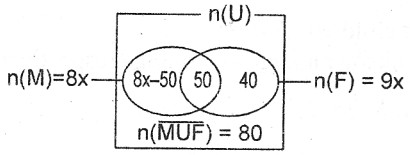
In a survey it was found that the ratio of the people who liked modern songs and folk songs is 8:9 out of which, 50 people like both songs, 40 like folk songs only and 80 liked none of the songs.

(i) उक्त तथ्यलाई भेनचित्रमा देखाउनुहोस् । Represent the above data in a venn diagram.

(ii) सर्वेक्षणमा भाग लिने मानिसहरूको संख्या पत्ता लगाउनुहोस् ।
Find the number of people who participated in the survey.

Solution:

Let M and F denotes who liked modern songs and folk songs respectively according to question,
$n(M) : n(F)$ 8:9 , then $n(M) = 8x$ and $n(F) = 9x$
$n(M \cap F) = 50$, $n_0(F) = 40$
and $n(\overline{M \cup F}) = 50$
Using venn-diagram



$n(F) = 50 = 40$
or, $9x = 90$
$\therefore \quad x = 10$
$n(M) = 8x = 8 \times 10 = 80$
$n(F) = 9x = 9 \times 10 = 50$
$\therefore \quad n(M \cup F) = (8x - 50) + 50 + 40 = 80 - 50 + 50 + 40 = 120$
$\therefore \quad n(\cup) = 120 + 80 = 200$
$\therefore$ Total number of people $n(\cup) = 20$

Model 11:

परीक्षामा समिलित भएका 120 विद्यार्थीहरू मध्ये गणितमा मात्र उतीर्ण हुने संख्या विज्ञान मात्र उत्तीर्ण हुनेको संख्या भन्दा दोब्बर छ । यदि 50 विद्यार्थीहरू दुवै विषय उत्तीर्ण भए र 40 विद्यार्थी दुवै विषयमा अनुत्तीर्ण भए भने

Out of 120 students appeared in an examination the number of students who passed in mathematics only is twice the number of students who passed in science only. If 50 students passed in both subjects and 40 students failed in both subject then

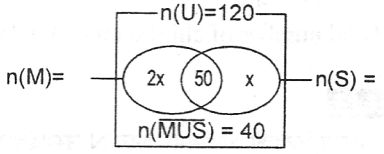
(i) गणितमा उत्तीर्ण हुने विद्यार्थी संख्या पत्ता लगाउनुहोस् । Find the no of students who passed in maths.

(ii) विज्ञानमा उत्तीर्ण हुने विद्यार्थी संख्या पत्ता लगाउनुहोस्।Find the number of students who passed in science.

(iii) प्राप्त नतिजालाई भेन चित्रमा प्रस्तुत गर्नुहोस् । Show the result in a venn-diagram.

Solution:

Total number of students $n(\cup) = 120$
Let M and S denotes who passed in
Maths and science respectively accorinding to the question
If $n_0(S) = x$ then $n_0(M) = 2x$
Using formula



$n(M \cap S) = 50$ $n(\overline{M \cup S}) = 40$
$n(\cup) = n(M \cup S) + n(\overline{M \cup S})$
or, $120 = n(M \cup S) + 40$
or, $120 - 40 = n(M \cup S)$
$\therefore \quad n(M \cup S) = 80$
Now, $n(M \cup S) = n_0(M) + n(M \cup S) + n_0(S)$
or, $80 = 2x + 50 + x$
or, $80 - 50 = 3x$
or, $3x = 30$
$\therefore \quad x = 10$
The number of students passed in maths
$n(M) = 2x + 50 = 2 \times 10 + 50 = 70$
The number of students passed in science
$n(S) = x + 50 = 10 + 50 = 60$

Model 12:

एउटा सर्वेक्षणमा एकतिहाई बालकहरूले आँप मात्र मन पराएछन् र 22 जना आँप पटकै मन पराउदैनन् । त्यस्तै $\frac{2}{5}$ बालकले सुन्तला मन पराएको पाइयो तर 12 जनाले चाही यी दुवै फलहरू मन नपराइएको पाइयो ।

In a survey one third of children like only orange and 22 receive mango at all. Also $\frac{2}{3}$ children like orange but 12 like none of them

(i) माथिको आँकडालाई भेन चित्रमा देखाउनुहोस् । (Show the above data in a venn-diagram.)

(ii) कति जनाले दुवै खाले फलफूल मन पराउदा रहेछन् । (How many children like both types of fruit ?)

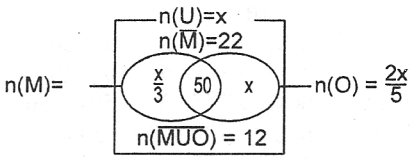
Solution:

Let the total number of childrens $(\cup) = x$

M and O denotes who like the mango and orange respectively.

$n_0(M) = \frac{1}{3}$ of $x = \frac{x}{3}$ $n(\overline{M}) = 22$

$n_0(O) = \frac{2}{5}$ of $x = \frac{2x}{5}$ and $n(\overline{M \cup O}) = 12$



Using venn-diagram

$\therefore \quad x = n(M \cup O) + 12$

$\therefore \quad x(M \cup O) = x - 12$

Again , $n(M) = x - 22$

Now, $n(M \cap O) = (x - 22) - \frac{x}{3} = \left(\frac{2x}{3} - 22\right)$

$n(M \cup O) = (x - 22) + \frac{2x}{5} - \left(\frac{2x}{3} - 22\right)$

or, $\quad x - 12 = x - 22 + \frac{2x}{5} - \frac{2x}{3} + 22$

or, $\quad -12 = \frac{6x - 10x}{15}$

or, $\quad -12 = -\frac{4x}{15}$

or, $\quad 12 \times 15 = 4x$

$\therefore \quad x = 45$

Total number of children $n(\cup) = 45$

Model 13:

एउटा नगरपालीकाको चुनावमा Mर N उम्मेदवारहरू मेयर पदका लागि उठेछन् र त्यहाँ मतदाताको सूचीमा 30,000 जना रहेछन् मतदातालवे एक जनालाई मात्रै मत खसाल्नु पर्ने थियो। 15000 जनाले M लाई त्यस्तै 12000 जनाले N लाई र 2000 जनाले दुवैलाई पनि मत दिएछनु। In an electin of a municipality two candidate M and N stood for the post of Mayor and 30,000 people were in the voter list, voters were suppurted to the cote for a single canditidates, 15000 people cast vote for M 12000 people cast for M and 2000 people cast vote even for both.

(i) यी जानकारीलाई भेन चित्रमा प्रस्तुत गर्नुहोस्। Show these information in Venn –diagram

(ii) कति जनाले मत खसलेनन् ? How many people did not cast vote ? Find it.

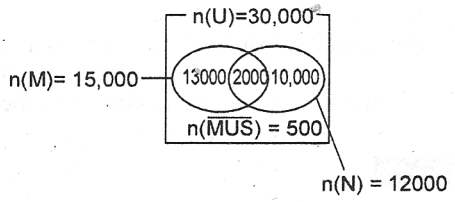
Solution:

Here, In an election total number of voters $n(v) = 30,000$

M and N are the candidates the mayor post for municipality

$n(M) = 15000, n(N0 = 12,000$ $n(M \cap N) = 2000$

Using Venn-diagram



(i) $n(M \cup N) = 13,000 + 2,000 + 10,000 = 25000$

$n(\overline{M \cup N}) = 30,000 - 25000 = 5000$

No. of people did not cast votes = 5000

(ii) No. of valid votes = $n_0(M) + n_0(N) = 1300 + 10,000 = 23000$

Practice Yourself

1. एउटा विद्यालयको 45% विद्यार्थीहरू फुटबल खेल्छन् 30% विद्यार्थीहरू बास्केट बल खेल्छन् र 30% ले दुवै खेल्छन् यदि 360 जनाले कुनै पनि खेल खेल्दैन भने भेन चित्र बनाई विद्यालयमा जम्मा विद्यार्थीहरूको संख्या पत्ता लगाउनुहोस् । साथै एउटा मात्र खेल खेल्ने विद्यार्थीहरूको संख्या पत्ता लगाउनुहोस् ।
   45% students of a school play football, 45% play Basket ball and 30% play both. If 360 students playn neither football nor basketball. Use venn-diagram and find the number of students in the school. Also, find, the number of students who play only one games. **(Ans: 800, 120)**
2. यदि A र B ∪ का उपसमूहहरू हुन् । यदि n (∪) = 90, n(A) = 45 n(B) = 35 र $n(\overline{A \cup B}) = 15$, माथिको तथ्य तथ्यलाई भेन चित्रमा प्रस्तुत गर्नुहोस् । तल दिइएको मान पत्ता लगाउनुहोस् ।
   If A and B are the subsets of a universal set ∪. If n(∪) = 90 n (A) = 45 n(B) = 35 and $n(\overline{A \cup B})$ = 15 illustrate this information in a venn-diagram and find
   (i) $n(A \cup B)$ (ii) $n(A \cap B)$ (iii) $n_0(A)$ (iv) $n_0(B)$ **(Ans: 75, 5, 40, 30)**
3. एउटा कक्षामा भएका 50 जना विद्यार्थीहरू लाई नेपाली इतिहास वा दुवै विषय मन पर्दछन् । ती मध्ये 20 जनाले दुवै विषय मनपराउछन् । यदि नेपाली मनपर्ने विद्यार्थीसंख्या र इतिहास मनपर्ने विद्यार्थी संख्याको अनुपात 3:2 छ भने भेनचित्र प्रयोग गरेर पत्ता लगाउनुहोस् ।
   50 students in a calss room like nepali, History or bath subject out of them 20 like both subjects. If the ratio of the number of students who like nepali and History is 3:2. Using venn diagram find.
   (i) कति जनालाई नेपाली मनपर्छ । (How many like Nepali.)
   (ii) कतिनालाई इतिहास मनपर्छ । (How may like Histroy.) **(Ans: 42,8)**
4. एउटा परीक्षामा 70 जना विद्यार्थीहरू गणितमा अनुत्तीर्ण भए 90 जना विज्ञानमा र 20 जना दुवै विषयमा अनुत्तीर्ण भए यदि 80 जना विद्यार्थी गणितमा उत्तीर्ण भए भेन चित्रको प्रयोग गरी पत्ता लगाउनुहोस् ।
   In an examination, 70 students failed in maths, 90 failed in science and 20 failed in both if 80 students passed in maths using venn-diagram find
   (i) कति जना विद्यार्थीहरू दुवै विषयमा उत्तीर्ण भए ?How many students were passed in both subjects? **(Ans:10,60)**
   (ii) विज्ञानमा कति जना उत्तीर्ण भए ? (How many were passed in science ?)
5. नेपाल भ्रमणमा आएका 500 जापानीज पर्यटकहरूले मध्ये 40% ले भारत र 30% ले चीन भ्रमण गरिसकेको रहेछन् । 10% ले दुवै देशको भ्रमण गरिसकेका रहेछन् । कति जना मानिसले दुवै देश घुमेका रहनेछन् ? भेन चित्र बनाई पत्ता लगाउनुहोस् ।
   Out of group of 500 japanese tourists who visited Nepal 40% have been already to india and 30% to china 10% of them have been to both countries. How many have not been to either of the countries. Also illustrate in a venn-diagram. **(Ans: 200)**
6. 50 जना मानिससँग गरिएको अन्तरवार्तामा 15 जनाले दूध मन पराए । तर कफी मन पराएनन् र 5 जनाले कफी र दूध दुवै मन पराए र 5 जनाले दुवै मन पराएनन् भने कति जनाले कफी मात्र मनपराए भेनभचित्र बनाई पत्ता लगाउनुहोस् । In an interview of 50 people 15 liked milk but not coffee, 5 liked coffee and milk and 5 receive liked both. By drawing a venn-diagram, find how many people like coffee only. **(Ans: 25)**
7. एउटा समूहमा गरिएको सर्वेक्षणमा 70% मानिसले लोकगीत मन पराइएको पाइयो 60% मानिसले आधुनिक गीत मन पराइएको पाइयो 4000 जनाले दुवैगीत मनपराइएको पाइयो र 10-% ले कुनै पनि गीत रुचि नदेखाइएको पाइयो भने ।
   In a survey of a group of people it was found 70% of the people liked folk songs 60% liked modern songs 4000 people liked both of them and 10% liked none of them
   (i) माथिको तथ्यलाई भेनचित्रमा प्रस्तुत गर्नुहोस् ।Draw venn-diagram to illustrate to above information.
   (ii) सर्वेक्षणमा भाग लिने गरिएको मानिसहरूको संख्या निकाल्नुहोस् ।
   Find the total number of people on the survey.
   (Ans: 10,000)

8. कांह मानिसहरूमा गरिएको सर्वेक्षणमा पाइयोकि 60 जनाले दूध पिउन मन पराउछन्, 40 जनाले दूध चिया मनपराउदैन 70 जनाले चिया पिउन मन पराउछन्, 15 जना दूध मनपराउछन् तर दूध मन पराउदैनन् । यो तथ्यलाई भेन चित्रमा भर्नुहोस् । र दुवै मन नपराउनेको संख्या पत्ता लगाउनुहोस् ।
In a survey of some people it is found that 60 people like to drink milk 40 donot like to drink milk 70 like to drink tea 15 like to drink tea but not milk fill this information in a venn-diagram and find out the number of students who donot like to drink both of them. (Ans: 25)

9. 2000 मानिस भएको कुनै ठाउँमा 550 जनाले गोरखापत्र 750 जनाले कान्तिपुर र 200 जनाले दुवै पढ्छन् । कति प्रतिशतले दुवै विषय पढदैनन् । यो जानकारीलाई भेनचित्रमा देखाउनुहोस् ।
In a place of 2000 people 550 read gorkhapatra 750 reas kantipur and 200 read both. what percent read neither of them illustrate the information in a venn diagram. (Ans: 45%)

10. पहिलो त्रैमासिक परीक्षामा गणितमा उत्तीर्ण 80 जना, गणितमा अनुत्तीर्ण 70 जना, विज्ञानमा अनुत्तीर्ण 90 जना र दुवैमा अनुतीर्ण 20 जना भए
In a first term exam, 80 students passed in maths 70 failed maths, 90 failed in science and 20 failed in both.
(i) उक्त तथ्यलाई भेनचित्रमा प्रस्तुत गर्नुहोस् ।Represent the above data in a venn-diagram
(ii) विज्ञानमा कति जना उत्तीर्ण भए होलान् । How many students were passed in science. (Ans: 60,10)

11. 200 जना विद्यार्थीहरू मध्ये 125 जना विद्यार्थीहरूले भूगोलमा उत्तीर्ण भए, 145 जना विद्यार्थीहरू अंग्रेजीमा उत्तीर्ण भए 20 जना विद्यार्थीहरू दुवै विषयमा अनुत्तीर्ण भए र 13 जना विद्यार्थीहरू परीक्षामा समिलित भएनन् भने
Out of 200 students 125 students passed in Geography. 145 passed in English, 20 failed in both the subject and 13 did not appear in the English examination. (Ans: 5%)
(i) माथि दिइएको तथ्यलाई भेन चित्रमा प्रस्तुत गर्नुहोस् ।
Represent the above information in a venn-digarm.
(ii) दुवै विषयमा उत्तीर्ण विद्यार्थीहरूको प्रतिशत कति होला ?
Find the percent of students who passed in both subject.

2. लिखित र मौखिक दुवै प्रकारको परीक्षामा सबै परीक्षार्थीहरू कम्तीमा एउटामा सफल भएछन् । 150 जना दुवैमा उत्तीर्ण भएका छन् । यदि 80% मौखिक परीक्षामा र 70% लिखितमा उत्तीर्ण छन् भने भेन चित्र प्रयोग गरी कुल विद्यार्थीको संख्या पत्ता लगाउनुहोस् ।
In an examination in reading and writing the number of students passed in at least one of the subject and 150 of them passed in both subject. If 80% of the them in reading and 70% in writing. Draw a venn-diagram of above information and find the ~~tot~~al number of students. (Ans: 300)

3. एउटा विद्यार्थीहरूको समूहमा 70% ले गणित पढेको छन् र 30% ले अंग्रेजी पढेको छन् । यदि अंग्रेजी पढ्ने सबैले गणित पढेका छन् र 150 जनाले दुवै विषय पढेका छैनन् भने गणित पढ्ने तर अंग्रेजी नपढ्ने विद्यार्थीहरूको संख्या भेनचित्र प्रयोग गरी पत्ता लगाउनुहोस् ।
In group of students, 70% students have studied mathematics and 30% have studied English. If all studemts who study English also study mathematics and 150 did not study both subject. Using a venn-diagram, find the number of students who study maths butnot English. (Ans: 200)

4. 200 जना मानिसको समूहमा गरिएको सर्वेक्षणमा 60 जनाले चिया मात्र मनपराउछन् र 20 जनाले कफी मात्र मनपराउछन् । यदि 60 जना मानिसले दुवैपेय पदार्थ मनपराउदैनन् भने
In a survey of a group of people 60 like tea only and 20 people like coeffe only. If 60 people did not liked both drinks then
(i) माथिको तथ्यलाई भेनचित्रमा प्रस्तुत गर्नुहोस् ।Represent above information in venn-diagrom
(ii) चिया मनपराउने र कफी मन पराउनेको मानिसहरूले अनुपात पत्ता लगाउनुहोस् ।
Find the ratio of the people who like tea to the people who like coffee. (Ans: 3:2)

25 जना विद्यार्थीहरू भएको एउटा कक्षामा 12 जना गणित पढ्छन् तर 8 जनाले गणित मात्र पढ्छन् र जीव विज्ञान पढदैनन भने जीवविज्ञान र गणित दुवै पढ्ने र गणित बाहेक जीव विज्ञान मात्र पढ्ने विद्यार्थीको संख्या पत्ता लगाउनुहोस् । भेनचित्र बनाएर समाधान गर्नुहोस् ।
In a class of 25 students 12 read mathematics, 8 read mathematics only, but not read Biology. Find the number of students who read mathematics and Biology both subject, and those who read only Biology but not mathematics slove by making venn-diagram. (Ans: 4, 13)

16. एउटा नगरपालीकाको चुनावमा A र B दुई उम्मेदवारहरू मेयर पदको लागि उठेछन् र त्यहाँ मतदाताको सुचीमा 25000 जना रहेछन्। मतदाताले एक जनालाई मात्रै भोट खसाल्नु पर्ने थियो। 12000 जनाले A लाई मात्रै 10,000 जनाले B लाई 8,000 जनाले दवैलाई मत दिएनछन्।

In an election of a municipality tow candidates A and B stood for nthe post Mayor and 25000 people were in the voter list – Voters were supposed t cast vote for a single candidate ,12000 people cast vote for A 10,000 people cast for B and 1000 people cast vote even for both

(i) यी जानकारीलाई भेनचित्रमा प्रस्तुत गर्नहोस्। Show these information in a venn –diagram

(ii) कति जनाले भोट खसालेनन? पत्ता लगाउनुहोस्। How many people did not cast vote ?Find it.

(iii) कति भोट सदर भयो ? पत्ता लगाउनुहोस्। How many votes were valid ? Find it. **(Ans: 4000,20,000)**

1. 2 तीनओटा समूहहरू समिलित समस्याहरू
Problems Based on three Sets

1. यदि $n(A) = 48$, $n(B) = 51$, $n(C) = 40$, $n(A \cap B) = 11$, $n(B \cap C) = 10$, $n(C \cap A) = 9$, $n(A \cap B \cap C) = 4$ र $n(\cup) = 120$ भए $n(A \cup B \cup C)$ र $n(\overline{A \cup B \cup C})$ को मान पत्ता लगाई उक्त तथ्यलाई भेन चित्रमा प्रस्तुत गर्नुहोस् ।

If $n(A) = 48$ $n(B) = 51$ $n(C) = 40$, $n(A \cap B) = 11$ $n(B \cap C) = 10$ $n(C \cap A) = 9$ $n(A \cap B \cap C) = 4$ and $n(\cup) = 120$, find the value of $n(A \cup B \cup C)$ and $n(\overline{A \cup B \cup C})$, present the above information in a venn-diagram.

Solution:

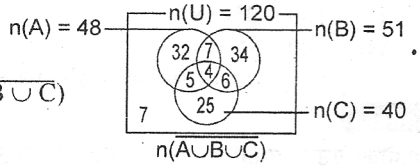
Here, $n(A) = 48$ $n(B) = 51$ $n(c) = 40$

$n(A \cap B) = 11$ $n(B \cap C) = 10$, $n(C \cap A) = 9$, $n(A \cap B \cap C) = 4$, $n(\cup) = 120$

Using formula,

$A(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(A \cap C) + n(A \cap B \cap C)$

$= 48 + 51 + 40 - 11 - 10 - 9 + 4 = 143 - 30 = 113$



$n(A \cup B \cup C) = 113$ $\therefore$ $n(\cup) = n(A \cup B \cup C) + n(\overline{A \cup B \cup C})$

or, $120 = 133 + n(\overline{A \cup B \cup C})$

or $120 - 113 = n(\overline{A \cup B \cup C})$ $\therefore$ $n(\overline{A \cup B \cup C}) = 7$

Model 2:

2. 100 जना मानिसहरूले सर्वेक्षणमा 65 जनाले कान्तीपुर, 45 जनाले गोरखापत्र, 40 जनाले हिमालय टाइम्स, 25 जनाले कान्तीपुर र गोरखापत्र 20 जनाले कान्तीपुर तथा हिमालय टाइम्स, 15 जनाले गोरखापत्र र हिमालय टाइम्स र 5 जनाले तीनैवटा पत्रिका पढ्ने गरेको पाइयो भने

In a survey of 100 people 65 read kantipur 45 Himalaya times, 15 read the Gorakhapatra as well as the Himalays times and 5 read all three new Papers.

(i) उक्त भेनचित्रलाई भेनचित्रमा प्रस्तुत गर्नुहोस् ।Show the above information in a venn diagram.

(ii) तीनै वटा पत्रिका नपढ्दे कति थिए ? How many people didn't read all three newpaper ?

Solution:

Total number of people $n(\cup) = 100$

25 read Kantipur as well as the Gorkhapatra 20 read the Kantipure as wel as Himalaya Times,

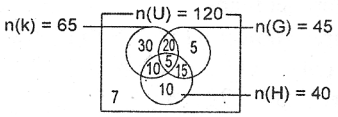
Let K, G and H who read kantipur Gorakhapatra and Himalaya times respectively, newspaper then $n(k) = 65$ $n(G) = 45$ $n(H)$

$= 40$, $n(K \cap G) = 25$, $n(K \cap H)$

$= 20$, $n(G \cap H) = 15$, $n(K \cap G \cap H) = 5$

Using venn-diagram

$n(K \cup G \cup H) = 30 + 10 + 20 + 15 + 10 + 5 = 95$



$n(\overline{K \cup G \cup H}) = 100 - 95 = 5$

$\therefore$ No, of people the did not like read three neqspaper $n(\overline{K \cup G \cup H}) = 5$

Model 3:

कुनै परीक्षामा समिलित परीक्षार्थीहरू मध्ये गणितमा 40%, विज्ञानमा 45%, स्वास्थ्यमा 55% परिक्षार्थीहरू उत्तीर्ण भए गणित र विज्ञानमा 10% विज्ञान र स्वास्थमा 20% र गणितमा 15% विद्यार्थीहरू उत्तीर्ण भएका रहेछन् भने,

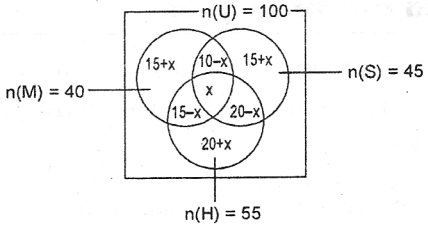
Of the total candidates it in an examination 40% students passed on maths 45% in science and 55% in Health. if 10% passed in maths and science 20% in science and Health and 15% in Health and maths.

(i) उक्त जानकारीलाई भेन चित्रमा देखाउनुहोस् । Draw a venn-diagram to show the above information.

(ii) तीनैओटै विषयमा उत्तीर्ण हुने विद्यार्थीहरूको प्रतिशत निकाल्नुहोस् ।

Calculate the percentage of students who passed in all three subject.

Solution:



Let the total number of students n $(\cup) = 100$

Now, M S and H denoted the who passes in maths, science and Health, respectively.

Them $n(M) = 40\% = 40$, $n(S) = 45\% = 45$, $n(H) = 55\% = 55$

$n(M \cap S) = 10\% = 10$, $n(S \cap H) = 20\% = 20$ and $n(H \cap M) = 15\% = 15$

If No. of students who passed in three subject $n(M \cap S \cap H) = x$

Using the venn-diagram

$n(\cup) = 15 + x + 15 + x + 20 + x + 10 - x + 20 - x + 15 - x + x$

or, $100 = 95 + x$

or, $100 - 95 = x$

$\therefore$ $x = 5$ No. of students who passed three subject $n(M \cup S \cap H) = 5\%$

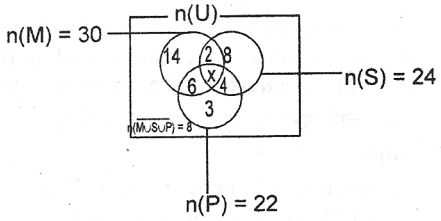
Model 4:

विद्यार्थीको एउटा समूहमा 30 ले गणित, 24 ले सामाजिक अध्ययन, 22 ले जनसंख्या, 14 ले गणित मात्र, 8 ले सामाजिक अध्ययन मात्र, 6 ले गणित र जनसंख्या मात्र, 2 ले गणित र सामाजिक अध्ययन मात्र गर्दछन् । 8 ले कुनै पनि विषय अध्ययन गर्दैन भने सो समूहमा कतिजना विद्यार्थीहरू छन् ?

In a group of students, 30 read maths, 24 read social students 22 read population, 14 read maths only, 8 read social students only, 6 read and population only 2 read maths and social students only and 8 read nine of these subjects using venn-diagram how many students are there in the group.

Let Solution:

Here,



Total number of students be $n(\cup)$

M, S and P demoted to the who reads

maths, social study and population respectively

then $n(M) = 30$ $n(S) = 24$ $n(p) = 22$,

$n_0(M) = 14$, $n_0(S) = 8$ $n_0(P \cap S) = 6$ $n_0(M \cap S) = 2$

$n(\overline{M \cup S \cup P}) = 8$

Here let reads

three subject $n(M \cap S \cap P) = x$

$n(M) = 14 + 2 + x + 6$

or, $30 = 22 + x$

$\therefore$ $x = 8$ $\therefore$ $n(M \cap S \cap p) = 8$

Let who reads only social students and population by y

or, $(s) = 2 + x + y + 8$

or, $24 = 2 + 8 + y + 8$

or, $24 = 18 + y$

$\therefore \quad y = 24 - 18 = 6$

$n_0 (S \cap P) = 6$

Again, let who reads only population be y

$n(p) = 6 + x + y + z$

or, $22 = 6 + 8 + 6 + z$

$\therefore \quad z = 22 - 20 = 2$

Total number of students group $n(\cup) = 14 + 2 + 8 = 6 + 8 + 6 + 2 = 46$

Model 5:

60 जना मानिसहरूसँग भएको अन्तर्वातामा नेविको पार्लेजी र कोकोनट विस्कुट क्रमशः 45,30 र 15 मनपराए । यदि दुई ओटा विस्कृटहरू मात्र मन पराउनेहरूको जम्मा संख्या 22 छ भने तीनवटै विस्कुटहरू मध्ये सबैले कम्तीमा कुनै एक विस्कृट मन पराए भने तीनैवटा विस्कुट मन पराउने संख्या भेनचित्रमा देखाई पत्ता लगाउनुहोस् ।

In a interview of people, Nebiko, parleji and coconut are liked by 45, 30 and 15 respectively. if the total number of people who liked only two biscuits is 22 and they all liked at least one of the biscuties. find the number of people who liked all the biscuntes also show given information in nthe Venn – diagram.

Solution:

Total number of people $(\cup) = 60$

Let the N, P and C dewted, nabieko, parlji and countnow $\cap(N) = 45$, $n(P) = 30$ and $n(C) = 15$

$n_0 (N \cap P) + n_0 (P \cap C) + n_0 (N \cap C) = 22$

Here $n(\cup) = (N \cup P \cup C) = 60$ $(N \cup P \cup C) = \phi$(null set)

Let if $n (N \cap P \cap C) = x$

Now, $n(N \cap P) = a$, $n_0 (P \cap C) = b$ $(n_0 (N \cap C) = c$

Again $n (N \cap P) = a + x$ $n (P \cap C) = b + x$ $n (N \cap C) = c + x$

Using formula

$n (N \cup P \cup C) = n (N) + n(P) + n (C) + n(N \cap P) + n (P \cap C)$

$+ n (C \cap N) + (N \cap P \cap C)$

or, $60 = 45 + 30 + 15 - (a + x) - (b + x) - (c + x) + x$

or, $60 = 90 - (a + b + c) - 2x$

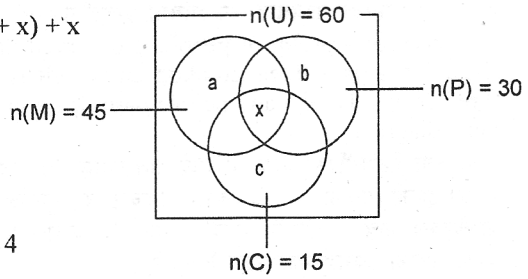
or, $60 = 90 - 22 - 2x$

or, $60 = 68 - 2x$

or, $2x = 68 - 60$

$\therefore \quad x = \frac{8}{2} = 4$

No of people who like three types of biscutes = 4



Model 6:

500 जना विद्यार्थीहरूले एउटा समूहले गणित नेपाली र विज्ञान मध्ये कम्तीमा एउटा विषय पढ्छन् । यदि एउटा मात्र विषय पढ्ने विद्यार्थी संख्या दुईवटा विषयमा मात्र पढ्ने विद्यार्थी संख्याको दोब्बर छ । तीनवटै विषय पढ्ने 10% भए एउटा विषय मात्र पढ्ने विद्यार्थीको संख्या पत्ता लगाउनुहोस् ।In survey of 500 students ewory students study at leart are of the three subject, maths Nepali and science. if the number of students who like only are subjects is twice the number of students who like only two subjects and 10% liked all three find the number of students who like only one subjects.

Soltuion:

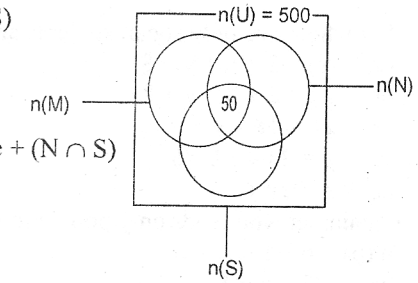
Total number of students $n(\cup) = 500$

Let M, N and S denoted who study maths, Nepali and science respectively, accodity to the question $n(M \cup N \cup S) = n(\cup) = 500$,

Then $n_0(M) + n_0(N) + n_0(S) = 2x\ n_0(M \cap N) + n_0(N \cap S)$

The $(M \cap S) = x$, $n(M \cap N \cap S) = 10\% = 10\%$ of 500

$$= \frac{10}{100} \times 500 = 50$$



$n(M \cup N \cup S) = n_0(M) + n_0(N) + n_0(S) + n_0(M \cap N)$ the $+ (N \cap S)$

$n_0(S \cap M) + n(M \cap N \cap S)$

or, $500 = 2x + x + 50$

or, $500 - 50 = 3x$

or, $450 = 3x$

$\therefore \quad x = 150$

$n_0(M) + n_0(N) + n_0(S) = x = 150$

Numberof students who like only one subjet is 150.

Practice Yourself

1. यदि n (A) = 65, n (B) = 50, n(S) = 35, n (A ∩ B) = 25 n (B ∩ C) = 20 n (C ∩A) = 15, n (A ∩ B ∩ C) = 5 र n (∪) = 100 भए n $(\overline{A \cup B \cup C})$ को मान निकाल्नुहोस् । उक्त तथ्य लाई भेनचित्रमा प्रस्तुत गर्नुहोस् ।

   If n(A) = 65 n(B) = 50 n (S) = 35 n (A ∩ B) = 25 n (B ∩ C) = 20 n(C ∩ A) = 15, n (A ∩ B ∩ C) = 5 and n (∪) = 100 then find n $(\overline{A \cup B \cup C})$ and represent in in venn-diagram. (Ans: 5)

2. विद्यार्थीहरूको एउटा समूहमा 20 जना लेखा पढ्छन्, 20 जना गणित पढ्छन् र 17 जना इतिहास पढ्छन् । 7 जनाले लेखा मात्र पढ्छन् , 10 जना गणित मात्र पढ्छन्, 6 जना लेखा र गणित मात्र पढ्छन् र 3 जना गणित र इतिहास मात्र पढ्छन् । भेन

   In a group of students 20 study Account, 20 study mathematics, 17 study History, 7 study Account only, 10 study mathematics only, 6 study mathematics and History only.

   (i) उक्त तथ्यलाई भेनचित्रमा प्रस्तुत गर्नुहोस् ।Represent the above information in venn diagram

   (ii) जम्मा कति विद्यार्थीहरू छन् ? निकाल्नुहोस् ।How many students are there altogether ? Find. **(Ans: 39)**

3. मानिसहरूको एउटा समूहमा गरिएको सर्वेक्षणले देखाउछ कि 60 जनाले चिया मनपराउछन्, 45 जनाले कफि मन पराउछन् , 30 जनाले दूध मनपराउछन्, 25 जनाले कफि र चिया 20 जनाले चिया र दूध मन पराउँछन् 15 जनाले कफि र दुध मन पराउछन् र 10 जनाले तीनै वटा पेय पदार्थ मनपराउछन् भने सर्वेक्षणमा कति जना मानिसले भाग लिन्छन् ? माथिको तथ्यलाई भेन चित्रमा प्रस्तुत गर्नुहोस् ।

   In survey of a group of people if observed that 60 liked tea, 45 liked coffee, 30 liked milk 25 liked coffee as will tea, 20 liked tea as well as milk 15 liked coffee as well a milk and 10 liked all three drinks. How many people partrcipate in survey? Also represets the above information in a venn diagram. **(Ans: 85)**

4. 200 जना विद्यार्थीहरू बीच गरिएको सर्वेक्षणमा 70 जनाले क्रिकेट, 30 जनाले फुटबल, र 100 जनाले बास्केट बल मनपराइएको पाइयो । 20 जनाले क्रिकेट र फुटबल मात्र 30 जनाले क्रिकेट र बास्केट वल मात्र, 40 जनाले बास्केटवल मात्र रुचाइएको पाइयो । यदि 20 जनाले फुटबल र बास्केट वल मात्र रुचाइएको पाइयो भने भेन चित्र बनाई तलका प्रश्नहरूको उत्तर दिनुहोस् ।

   In a survey of 200 students 70 are found of playing cricket, 30 foodball and 100 basket ball similary 20 are found of playing cricket and football only. 30 cricket and basket ball only. 40 are found of playing basket ball only. If 20 students are found of playing football and basket ball only by drowing venn-diagram find

   (i) सबै खेल रूचाउने संख्या पत्ता लगाउनुहोस् । Number of students who play all games.

   (ii) कुनै पनि खेल नरुचाउने विद्यार्थी संख्या निकाल्नुहोस् । How many students did not play any game? **(Ans: 10,20)**

. एउटा कक्षामा 58% विद्यार्थी लेखामा, 39% अंग्रेजीमा 25% तथ्याङ्कशास्त्रमा, 32% लेखा र अंग्रेजीमा, 19% लेखा र तथ्याङ्कशास्त्रमा, 17% तथ्याङ्कशास्त्र र अंग्रजीमा र 13% तीनैवटा विषयमा अनुत्तीर्ण भए भने

In a class 58% students failed in Account 39% in English and 25% in statrstics, 32% in Account and English, 19% in account and statistics 12% in English and statrstics 13% failed in all the three subjects.

(i) माथिको जानकारीलाई देखाउन एउटा भेन चित्र खिच्नुहोस् ।
Draw a venn-diagram to show above informatia

(ii) तीनै वटा विषयमा कति प्रतिशत उत्तीर्ण भएछन् ? What percent passed in all three subject. **(Ans: 33%)**

6. उपभोक्ताहरू मध्ये तीन प्रकारका खानेकुराहरू L,M र N मध्ये कुनलाई प्राथमिकता दिन्छन् भनि गरिएको सर्वेक्षणमा 60% ले L, 50% ले M, 50% ले N, 30% ले L र M, 20% ले M र N, 30% ले N र L, 10% तीनै ओटै प्रकारका खानेकुरालाई मनपराउछन् भने पाइयो ।
In survey concerning the preference of consumer for three L, M and N it was found that 60% liked food L, 50 % liked food M, 50% liked food N, 30 % liked L and M, 20% liked M and N, 30% liked N and L, 10% liked all three foods.

(i) माथिको तथ्यलाई भेनचित्रमा प्रस्तुत गनुहोस् ।
Draw a venn diagram to illustrate the above information

(ii) कति प्रतिशतले तीनैओटा खानेकुरा मन पराउदैनन् । What percentage did not like all three foods. **(Ans: 10%)**

7. विद्यार्थीहरूको एउटा समूहमा 15 जना अंग्रजी, 12 जना नेपाली, 10 जना लेखा, 6 जना अंग्रेजी र नेपालीमात्र, 4 जना नेपाली र लेखामात्र, 3 जना अंग्रेजी र लेखामात्र पढ्छन् तर नेपाली मात्र पढ्ने कोही पनि छैन भने भेन चित्र प्रयोग गरी पत्ता लगाउनुहोस् ।
In a group of students, 15 read English, 12 read Nepali, 10 read Account, 6 read English and Nepali only, 4 read nepali and account only, 3 read English and account only and there is not one who reads Nepali only. Draw venn-diagram for this information and find

(i) समूहमा भएको जम्मा विद्यार्थीहरूको संख्या
Total number of students in the group.

(ii) लेखामात्र अध्ययन गर्ने विद्यार्थीहरूको संख्या ?
Number of students reading account only. **(Ans: 20,1)**

8. 20 जना विद्यार्थीहरूको एउटा समूहले नेपाली अंग्रेजी र गणित मध्ये कम्तिमा एउटा विषय पढ्छन् । अंग्रेजी पढ्ने हरेक विद्यार्थीहरू नेपाली पढ्छन् 3 जना विद्यार्थीहरू तीनओटै विषय पढ्छन् । 4 जना नेपाली मात्र पढ्छन् 8 जना विद्यार्थीहरू अंग्रेजी पढ्छन् 14 जना नेपाली पढ्छन् भने
Each of a group of 20 students study at least one of the three subject Nepali English and maths all those who study English also study Nepali, 3 study all three subjects, 4 students study only Npali, 8 students study English 14 students Nepali.

(i) उक्त तथ्यलाई भेनचित्रमा प्रस्तुत गर्नुहोस् । Draw venn-diagram to illustrate above information.

(ii) कतिजना विद्यार्थीहरू नेपाली र गणित तर अंग्रेजी पढ्दैनन् ?
How many student study maths and Nepali but English

(iii) कतिजना विद्यार्थीहरूले गणित मात्र पढ्छन् । How many students study maths only. **(Ans: 2, 6)**

9. 45 जनाको अन्तवार्तामा संकलीत सुचना अनुसार 12 जनाले गणित र विज्ञान, 5 जनाले गणित र अंग्रेजी, 25 जनाले गणित 23 जनाले विज्ञान, 4 जनाले तीन ओटै विषयहरू, 15 जनाले अंग्रेजी, 10 जनाले विज्ञान र अंग्रेजी मनपराउछन् भने,
The following information was collected in an interview of 45 students 12 liked mathematics and science 5 liked mathematics and English 25 liked mathematics 23 liked science, 4 liked all three subjects. 15 liked English, 10 liked science and English.

(i) माथिको तथ्यको आधारमा भेन चित्र खिच्नुहोस् । (Draw venn-diagram to illustrale the above information)

(ii) तीनओटै विषय मन नपराउने विद्यार्थीहरूको संख्या पत्ता लगाउनुहोस्।
Find how many students did not like any of the three subject. **(Ans: 5)**

10. एउटा स्कुलमा 28 जना शिक्षकहरू मध्ये 15 जनाले अंग्रेजी पढाउँछन् 15 जनाले गणित पढाउछन, 14 जनाले नेपाली पढाउछन्, 7 जनाले अंग्रेजी र गणित पढाउँछन् 6 जनाले अंग्रेजी र नेपाली पढाउँछन् , 5 जनाले गणित र नेपाली पढाउछन् भने भेन चित्र बनाई पत्ता लगाउनुहोस् कति जनाले सबै विषय पढाउछन् ? कति जनाले गणित मात्र र नेपाली मात्र पढाउछन् ।
In a group of 28 teacher of a school, 15 teach English, 15 teach Maths, 14 teach Nepali, 7 teach English and Maths, 6 teach English and Nepali, 5 teach Nepali and Maths. Draw a venn diagram and above information find how many teach all three dubjects, how many teach Maths only and Nepali only. **(Ans: 2,55)**