1. (d) Total number of students $= 100 + 50 - 25 = 125$

2. (a) 3. (c) 4. (b) 5. (b)

6. (a) Total number of students $= 100$

Let E denote the students who have passed in English.

Let M denote the students who have passed in Maths.

$\therefore n(E) = 75, n(M) = 60$ and $n(E \cap M) = 45$

we know $n(E \cup M) = n(E) + n(M) - n(E \cap M)$

$= 75 + 60 - 45 = 90$

Required number of students $= 90 - 45 = 45$

7. (a) 8. (b)

Part - II

1. (d) Chemistry but not Physics $= c + f = 206$.
2. (c) Physics and Maths but not Chemistry $= a + e + g = 628$.
3. (a) Physics but neither Maths nor Chemistry $= a = 164$.
4. (c) Employees who doesn't have VCD $= 100 - 70 = 30\%$

Employees who doesn't have MWO $= 100 - 75 = 25\%$

Employees who doesn't have AC $= 100 - 80 = 20\%$

Employees who doesn't have WM $= 100 - 85 = 15\%$

$\therefore$ Total employees who doesn't have atleast one of the four equipments $= 30 + 25 + 20 + 15 = 90\%$

$\therefore$ Percentage of employees having all four gadgets $= 100 - 90 = 10\%$.

5. (b) Let $A = \{1, 2, 5, 6\}$ and $B = \{1, 2, 3\}$

$\therefore A \times B = \{(1, 1), (1, 2), (1, 3), (2, 1), (2, 2), (2, 3), (5, 1), (5, 2), (5, 3), (6, 1), (6, 2), (6, 3)\}$

and $B \times A = \{(1, 1), (1, 2), (1, 5), (1, 6), (2, 1), (2, 2), (2, 5), (2, 6), (3, 1), (3, 2), (3, 5), (3, 6)\}$

$\Rightarrow (A \times B) \cap (B \times A)$

$= \{(1, 1), (1, 2), (2, 1), (2, 2)\}$

6. (d) Consider the set given in option 'd'.

$\{x \mid x^2 + 1 = 0, x \in R\}$

Let $x^2 + 1 = 0 \Rightarrow x^2 = -1 \Rightarrow x = \pm i$ which is complex.

But $x \in R$. Hence for, any $x \in R$, $x^2 + 1$ can not be zero.

7. (c) Let total number be x. Then

$n(A) = \frac{72}{100}x = \frac{18x}{25}$, $n(B) = \frac{44}{100}x = \frac{11x}{25}$ and

$n(A \cap B) = 40$ $n(A \cap B) = n(A) + n(B) - n(A \cup B)$

$\Rightarrow x = \frac{18x}{25} + \frac{11x}{26} - 40 \Rightarrow \frac{29x}{25} - x = 40$

$\Rightarrow \frac{4x}{25} = 40 \Rightarrow x = 250$

8. (b) $n(C) = 63\%$

$n(A) = 76\%$

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

$100\% = 63\% + 76\% - X\%$

$X\% = 39\%$

9. (b) We know that there are 25 prime number below 100.

$n(A) = 25$

The total number of subsets of sets $A = 2^{25}$

There are 50 odd numbers below 100.

The total number of subsets of $B = 2^{50}$

Required ratio $= \frac{2^{25}}{2^{50}} = 2^{-25}$.

10. (b) $n(A) = 12, n(B) = 17, n(A \cup B) = 21$

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

$21 = 12 + 17 - n(A \cap B)$ or $n(A \cap B)$

$= 12 + 17 - 21 = 8$

$\Rightarrow$ $A \cap B$ has 8 elements.

11. (b) Let the set E and M represent students who passed in English and Mathematics respectively.

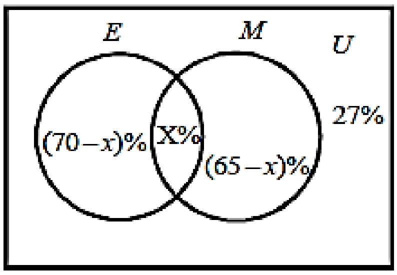
$n(E \cup M) = (100-27)\% = 73\%$

$n(E \cup M) = n(E) + n(M) - n(E \cap M)$

$73\% = 70\% + 65\% - x\%$

$x\% = 62\%$

Now. $62\% \equiv 248$



$\therefore$ Total number of candidates $= \frac{248 \times 100}{62} = 400$

12. (b) As A has p elements and B has q elements so, $A \times B$ has pq elements.

13. (d) $A = \{(n, 2n) : n \in N\}$ and $B = \{(2n, 3n)\} : n \in N$

Listing few members of each set

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

$B = \{(2, 3), (4, 6), (6, 9)......\}$

There is no member common to both these sets, hence.

$A \cap B = \phi$

14. (a) We know, for two sets A and B

$A - B = A - (A \cap B)$

$\therefore n(A - B) = n(A) - n(A \cap B)$

Given, $n(A) = 115, n(B) = 326$ and $n(A - B) = 47$

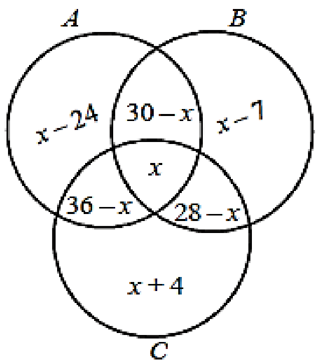
$\Rightarrow 47 = 115 - n(A \cap B)$

$\Rightarrow n(A \cap B) = 68$

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

$= 115 + 326 - 68 = 373$

(15-18).



Let x % people read all the three newspapers.
Since 8% people do not read any newspapers.

$\therefore$ $(x-24)+(x-7)+(x+4)+(30-x)+(36-x)+(28-x)+x=92$

$\Rightarrow$ $x+98-31=92$

$\Rightarrow$ $x=92-67=25$

15. (b) Hence people who read all the three newspapers = 25%

16. (d) $(30-x)+(36-x)+(28-x)=94-3x$
$=98-3\times 25=23$

Hence percentage of people who read only two newspapers = 23%

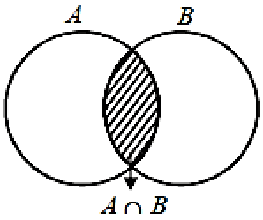
17. (b) $(x-24)+(x-7)+(x+4)=3x-27$
$=3\times 25-27=48$

Hence percentage of people who read only one newspaper = 48%

18. (c) $x-24=25-24=1$

Hence percentage of people who read only Newspaper A but neither B nor C = 1%

19. (d)

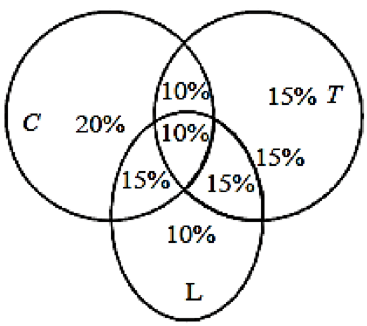


$A\cap(A\cup B)=(A\cap A)\cup(A\cap B)=\mathrm{A}\cup(\mathrm{A}\cap\mathrm{B})$
$=A$ (By diagram)

Thus, $A\cap(A\cup B)=A$

20. (c) $n(A)=40$, $n(B)=50$, $n(A\cap B)=10$.
$n(A\cup B)=n(A)+n(B)-n(A\cap B)=40+50-10=80.$
$\therefore$ Percentage reading either or both newspapers = 80%.
Hence, percentage reading neither newspaper
$=(100-80)\%=20\%$

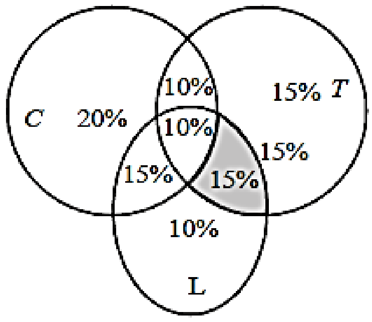
(21 – 24)



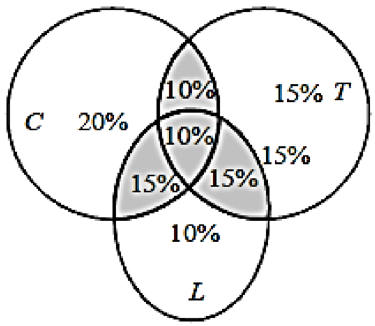
Where C = Coffee, T = Tea and L = Lassi

21. (b) The passengers who like only coffee = 20% and the passengers who like only lassi = 10%
Required passengers = 100%

22. (a) It can be seen that the percentage of passengers who like both tea and lassi but not coffee = 15%. This is the figure representing this area



23. (c) The percentage of passengers who like at least 2 of the coffee, tea and lassi can be seen in the below figure:

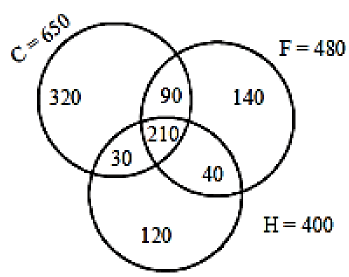


24. (b) 10% of the people like only lassi. So, the number of persons = 18

25. (a) $n(A\cup B\cup C)=n(A)+n(B)+n(C)-n(A\cap B)$
$-n(A\cap C)-n(B\cap C)+n(A\cap B\cap C)$
$\Rightarrow 100-18=42+68+51-30-28-36+x$
$\Rightarrow x=15$

(26-29) :

$n(C)=650$, $n(F)=480$, $n(H)=400$
$n(C\cap F)=300$, $n(F\cap H)=250$, $n(C\cap H)=240$
and $n(C\cup F\cup H)=(100-5)\%$ of $1000=950$
Since, $n(C\cup F\cup H)=n(C)+n(F)+n(H)-n(C\cap F)$
$-n(F\cap H)-n(C\cap H)+n(C\cap F\cap H)$
$\Rightarrow n(C\cap F\cap H)=210$



26. (b) **27.** (d) **28.** (c) **29.** (b)