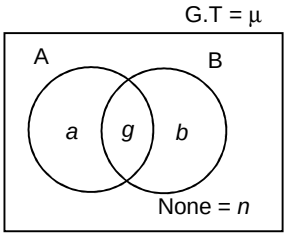
CHAPTER – 7
VENN DIAGRAMS

Venn Diagrams involving two variables:



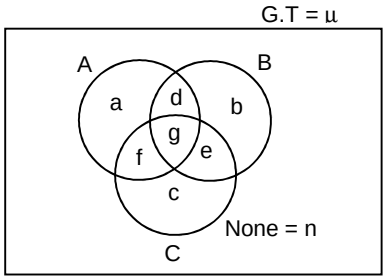
In the above diagram, A and B represent two different sets and the various regions can be referred to as given below.

A = a + g ; B = b + g
Only A = a; Only B = b
Exactly one set = a + b
A and B = g ; Only A and B = g
Exactly two sets = g

At least one set = Exactly one + Exactly two
= a + b + g = T

Grand Total (G.T = μ) = a + b + g + n = T + n
A + B = a + b + 2g = T + g
A or B = a + b + g = T
Does not belongs to A = b + n
Does not belongs to B = a + n

Venn Diagram with three variables:



Here A, B and C are three different sets and the various regions can be referred to as given below.
A = a + d + g + f ; Only A = a
B = b + d + g + e ; Only B = b
C = c + f + g + e ; Only C = c
Exactly one set = a + b + c ;
A and B = d + g ; B and also C = e + g ; C as well as A = f + g ;

Only A and B = d ; A and B but not C = d ;
Only B and C = e ; B and C but not A = e ;
Only C and A = f ; C and A but not B = f ;
Exactly two sets = d + e + f ;

A, B and C = All the three = Only A, B and C = g;
Exactly three sets = g ;
None among A, B and C = n ;

At least one set = Exactly one + Exactly two + Exactly three = a + b + c + d + e + f + g = μ – n
At least two sets = Exactly two + Exactly three
= d + e + f + g

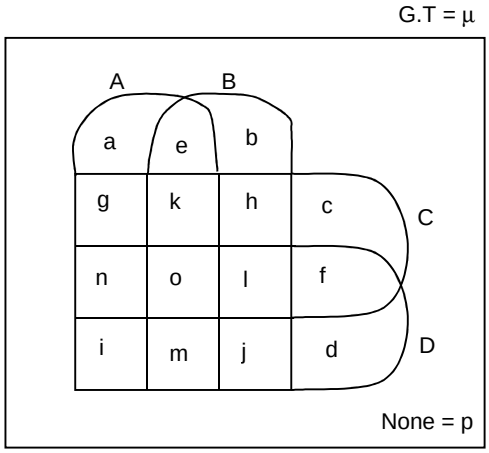
At least three sets = Exactly three = g
At most one sets = Exactly one + None = a + b + c + n
At most two sets = Exactly two + Exactly one + None = d + e + f + a + b + c + n = μ – g

At most three sets = Exactly three + Exactly two + Exactly one + None = g + d + e + f + a + b + c + n = μ

A + B + C = a + b + c + 2(d + e + f) + 3g
= Exactly one + 2(Exactly two) + 3(Exactly three)
= (Exactly one + Exactly two + Exactly three) + Exactly two + 2 (Exactly three)
= At least one + Exactly two + 2(Exactly three)
= At least one + (Exactly two + Exactly three) + Exactly three
= At least one + At least two + At least three

Does not belong to A = b + e + c + n
A or B or C = a + b + c + d + e + f + g = At least one.
A or B = a + b + d + e + f + g
A or B but not C = a + d + b
Neither A nor B = c + n
(A and B) or C = d + c + f + g + e
A and (B or C) = d + g + f

Venn diagram involving four variables:



Here, A, B, C and D are four different sets and the various regions can be referred to as given below.
A = a + e + g + k + n + o + i + m; Only A = a
B = b + e + h + k + l + o + j + m; Only B = b
C = c + f + h + l + k + o + g + n; Only C = c
D = d + f + j + l + m + o + i + n; Only D = d

Exactly one set = a + b + c + d

A and B = e + k + o + m ; Only A and B = e ;
A and C = g + k + o + n ; Only A and C = g ;

A and D = n + o + i + m ; Only A and D = i ;
B and C = k + h + o + l ; Only B and C = h ;
B and D = m + j + o + l ; Only B and D = j ;
C and D = n + o + l + f ; Only C and D = f ;
Exactly two sets = e + f + g + h + i + j

A, B and C = k + o ; Only A, B and C = k ;
B, C and D = l + o ; Only B, C and D = l ;
A, B and D = m + o ; Only A, B and D = m ;
A, C and D = n + o ; Only A, C and D = n ;

Exactly three sets = k + l + m + n
A, B, C and D = All the four = Exactly four set = o;
None among A, B, C and D = p

Important Note:

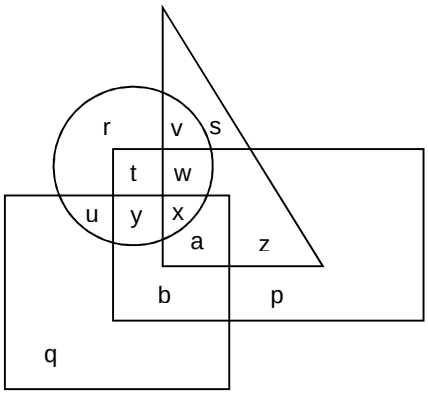
Note the following for a n-set Venn Diagram:

Name of the region (pocket of intersection of the sets)	Number of regions (pockets of intersections of the sets)	For a 5-set situation
Exactly 1, X	$^nC_1$	5
Exactly 2, Y	$^nC_2$	10
Exactly 3, Z	$^nC_3$	10
Exactly 4, A	$^nC_4$	5
Exactly 5, B	$^nC_5$	1
None, N	$^nC_0$	1
Total Number of regions	2^n	32

Exercise – 7(a)

Directions for questions 1 to 5: These questions are based on the following diagram.

In the following diagram, the Circle represents all the people who like MAAZA, the Square represents all the people who like Thumbs up, the Triangle represents all the people who like Marinda and the Rectangle represents all the people who like Coca-Cola.



1. Which of the following represents the people who like coca-cola and Thumbs up?
(A) r (B) u (C) b (D) q

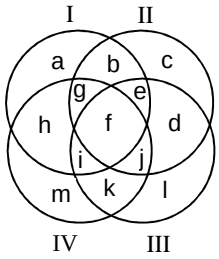
2. Which of the following represents the people who like Marinda but not Thumbs up?
(A) v, s, w, x (B) v, s, z, a
(C) v, w, x, a (D) None of these

3. Which of the following represents the people who like Maaza and Thumbs up?
(A) u, t, w (B) v, w, x
(C) b, a, x (D) u, y, x

4. Which of the following represents the people who like both Maaza and Marinda but not any of other two?
(A) y (B) v
(C) u (D) None of these

5. Which of the following represents the people who like Marinda, Maaza, Coca-cola but not Thumbs up?
(A) b (B) r (C) s (D) w

Directions for questions 6 to 10: These questions are based on the following diagram.



In the above diagram,

Circle I represents the athletes who participated in Swimming.

Circle II represents the athletes who participated in Running.

Circle III represents the athletes who participated in Javelin throw.

Circle IV represents the athletes who participated in Long jump.

6. Which of the following represents the athletes who participated neither in Running nor in Long jump?
(A) j, k (B) c, d (C) a, l (D) k, l

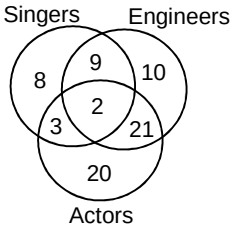
7. Which of the following represents the athletes who participated in Running and Swimming?
(A) a, h, b, g, e, f (B) a, b, c
(C) g, e, f (D) b, g, e, f

8. Which of the following represents the athletes who participated in all the four events?
(A) g (B) j
(C) i (D) f

9. Which of the following represents the athletes who participated in exactly three of the four events?
(A) h, b, k, d (B) g, e, i, j
(C) a, c, d, k (D) f, j, k, i

10. Which of the following represents the athletes who participated in Swimming and Javelin throw but not in Running?
(A) j (B) g (C) k (D) i

Directions for questions 11 to 15: These questions are based on the following Venn diagram.



11. How many Engineers are also Singers?
(A) 15 (B) 9
(C) 11 (D) 21

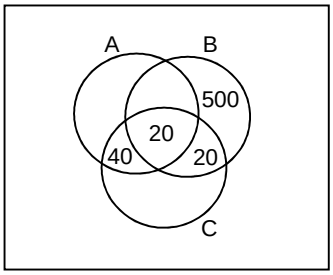
12. How many Actors are not Engineers?
(A) 24 (B) 23
(C) 15 (D) 18

13. How many Singers are Actors but not Engineers?
(A) 8 (B) 3 (C) 9 (D) 21

14. How many Engineers are either Singers or Actors but not both?
(A) 25 (B) 28 (C) 35 (D) 30

15. How many Singers are Actors as well as Engineers?
(A) 21 (B) 9
(C) 3 (D) 2

Directions for questions 16 to 20: The following Venn diagram represents the 1200 employees of a company. Each of the employees is a member of at least one of three clubs – A, B and C. Using the given data, answer the questions that follow.



Total member of club A = 420
Total member of club B = 590
Total member of club C = 340

16. How many employees are member of club C only?
(A) 250 (B) 240 (C) 180 (D) 260

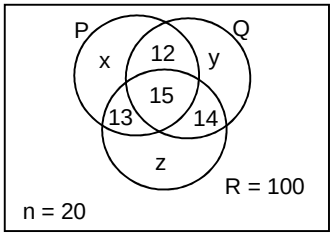
17. How many employees are member of both club A and club B?
(A) 50 (B) 80 (C) 70 (D) 60

18. How many employees are not member of club B?
(A) 340 (B) 610 (C) 630 (D) 290

19. How many employees are member of club A or club C?
(A) 850 (B) 700 (C) 975 (D) 675

20. How many employees are member of exactly two clubs?
(A) 110 (B) 130 (C) 98 (D) 78

Directions for questions 21 to 25: These questions are based on the following Venn diagram.



P represents the number of students who have voter ID card.
Q represents the number of students who have Passport.
R represents the number of students who have PAN card.
n represents the number of students who do not have any of the three ID proofs i.e. Voter ID card, Passport and PAN card.

21. If the number of students who have Voter ID card is same as that of those who have Passport which in turn is PAN card, then how many students have at least one of the three ID proofs?
(A) 260 (B) 279 (C) 250 (D) 231

22. If the number of students who have voter ID card is half of the number of students who have PAN card then, how many students have only voter ID card?
(A) 10 (B) 20
(C) 15 (D) Cannot be determined

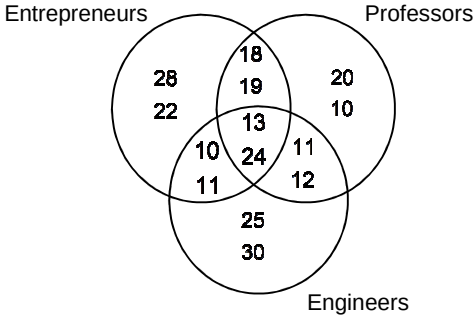
23. How many students have neither voter ID card nor Passport?
(A) 64 (B) 50 (C) 78 (D) 72

24. If $\frac{x}{y} = \frac{2}{1}$ and $\frac{y}{z} = \frac{1}{2}$ then how many students have only voter ID card?
(A) 60 (B) 58 (C) 29 (D) 18

25. If x = y = z then how many students do not have PAN card?
(A) 120 (B) 138
(C) 160 (D) None of these

Directions for questions 26 to 30: These questions are based on the following Venn diagram.

In this diagram there are two numbers in each segment, one atop the other. The number at the top represents the number of male and the number at the bottom represents the numbers of female.



26. How many female Entrepreneurs are Professors also?
(A) 20 (B) 23 (C) 47 (D) 43

27. How many Professors are neither Entrepreneurs nor Engineers?
(A) 20 (B) 28 (C) 30 (D) 38

28. How many male Professors are not Entrepreneurs?
(A) 29 (B) 31 (C) 49 (D) 58

29. How many females are not Engineers?
(A) 51 (B) 48 (C) 58 (D) 60

30. How many Professors are also Entrepreneurs as well as Engineers?
(A) 37 (B) 40 (C) 48 (D) 51

Exercise – 7(b)

Directions for questions 1 to 5: These questions are based on the following information.

In a class of 150 students, 45 take History, 65 take Geography and 10 take both History and Geography.

1. How many students take only Geography?
(A) 45 (B) 10 (C) 55 (D) 65

2. How many take only History?
(A) 65 (B) 35 (C) 10 (D) 45

3. How many do not take either History or Geography?
(A) 10 (B) 35 (C) 100 (D) 140

4. How many students take at least one subject?
(A) 10 (B) 90 (C) 50 (D) 100

5. How many students do not take any of the two subjects?
(A) 90 (B) 10 (C) 50 (D) 100

Directions for questions 6 to 10: These questions are based on the following information.

In a survey conducted among 200 mobile phone using families, it was found that 140 use Panasonic, 120 use Nokia and 143 use Siemens. 95 use both Panasonic and Nokia, 85 use both Nokia and Siemens and 93 use both Panasonic and Siemens. 70 families use mobile phones of all the three companies.

6. How many families use mobilephones of only Siemens?
(A) 50 (B) 35 (C) 70 (D) 143

7. How many families use mobilephones of both Panasonic and Nokia but not Siemens?
(A) 25 (B) 57 (C) 165 (D) 95

8. How many families use mobilephones of exactly one Company?
(A) 63 (B) 67 (C) 70 (D) 200

9. How many families use neither Panasonic nor Siemens?
(A) 40 (B) 120 (C) 110 (D) 10

10. How many families use none of the mobilephones?
(A) 10 (B) 70
(C) 0 (D) Cannot be determined

Directions for questions 11 to 15: Study the following data and the table to answer the questions that follow.

A survey was conducted among 100 students in a class who read detective novels written by Conan Doyle or Agatha Christie or both. Due to some recording error in the computer most of the figures were missing.

The following table shows the remaining data.

	Doyle	Christie	Both	Total
Male				
Female	40			
Total		70		100

Further it is known that
(A) 37% of the students read both Doyle and Christie.
(B) The ratio of males to females is 1 : 1.
(C) 50% of the females read books of both the authors.

11. How many males read books by both the authors?
(A) 10 (B) 12 (C) 37 (D) 45

12. How many students read books by only Christie?
(A) 70 (B) 10 (C) 33 (D) 23

13. How many females read books by only Doyle?
(A) 25 (B) 40 (C) 35 (D) 15

14. How many students do not read books by both the authors?
(A) 12 (B) 27 (C) 37 (D) 63

15. How many males read books by Doyle?
(A) 27 (B) 67 (C) 12 (D) 15

Directions for questions 16 to 20: These questions are based on the following information.

In a marriage party, ice creams of three different flavours Vanilla, Strawberry and Chocolate are served. Among the guests, 100 guests have eaten Vanilla ice cream, 150 guests have eaten Strawberry ice cream and 170 guests have eaten Chocolate ice cream. 50 guests have eaten Vanilla and Strawberry ice creams. 60 guests have eaten chocolate and Strawberry ice creams. 30 guests have eaten Vanilla and Chocolate ice creams. 20 guests have eaten all the three flavoured ice creams and 80 guests have not eaten any ice cream.

16. How many guests have attended the party?
(A) 250 (B) 280 (C) 400 (D) 380

17. How many guests have eaten the ice creams of at least two flavours?
(A) 190 (B) 100 (C) 150 (D) 180

18. How many guests have eaten the ice creams of Vanilla and Strawberry flavours only?
(A) 20 (B) 30 (C) 40 (D) 10

19. How many guests have eaten Vanilla ice cream and Chocolate ice cream but not Strawberry ice cream?
(A) 40 (B) 30 (C) 10 (D) 20

20. How many guests have not eaten the Vanilla ice cream?
(A) 170 (B) 150 (C) 250 (D) 280

Directions for questions 21 to 25: These questions are based on the following information.

In a locality, three magazines are read, namely India Today, Sports Star and Business India. 45 people read only one magazine, 20 read exactly two magazines and 5 read all the three. There is no one who does not read any of the three magazines.

21. How many people are there in the locality?
(A) 65 (B) 70 (C) 50 (D) 90

22. How many people read at least two magazines?
(A) 25 (B) 20 (C) 50 (D) 45

23. If the ratio of people who read India Today is to those who read Sports Star is to those who read Business India is 2 : 3 : 4 and 18 people read India Today, then how many read Sports Star?
(A) 28 (B) 31 (C) 27 (D) 54

24. If 10 people stop reading India Today and start reading Business India, then what is the maximum number of people who read exactly two magazines?
(A) 20 (B) 30
(C) 25 (D) 55

25. What percentage of the people who read at least one magazine read exactly two magazines?
(A) 25% (B) 20%
(C) $28^4/_7\%$ (D) None of these

Directions for questions 26 to 30: These questions are based on the following information.

In a music centre 'Sangeet Mahal' there were cassettes belonging to the various types of music. It was found that 125 cassettes were of Pop Music, 135 cassettes were of classical Music and 95 cassettes were of Light Music. 60 cassettes had a mixture of at least two of the music types and 10 cassettes had a mixture of all the three. Every cassette in the music centre contained at least one of the above mentioned types of music.

26. How many cassettes were of exactly one type of music?
(A) 60 (B) 70 (C) 225 (D) 200

27. How many cassettes were of exactly two types of music?
(A) 60 (B) 50 (C) 100 (D) 90

28. How many cassettes had music of at least one type?
(A) 285 (B) 225 (C) 90 (D) 205

29. If the number of cassettes of only Pop Music is equal to that of only Light Music, which is twice of the number of cassettes of only Classical Music type, then how many cassettes of only Classical Music were there?
(A) 225 (B) 75 (C) 90 (D) 45

30. If the number of cassettes of only Pop Music is equal to 75 and the number of cassettes of both Pop and Classical but not Light is equal to the number of cassettes of both Pop and Light but not Classical, then how many cassettes are there in the Music Centre which are both Classical and Light but not Pop?
(A) 0 (B) 20 (C) 50 . (D) 10

Exercise – 7(c)

Directions for questions 1 to 3: These questions are based on the following information.

In a class of 100 students, 50 students passed in Mathematics and 70 passed in English. 5 students failed in both Mathematics and English.

1. How many students passed in both the subjects?
(A) 25 (B) 50 (C) 70 (D) 5

2. How many students passed in exactly one of the two subjects?
(A) 5 (B) 15 (C) 95 (D) 70

3. How many students failed in at least one subject?
(A) 95 (B) 50 (C) 75 (D) 70

Directions for questions 4 to 6: These questions are based on the following information.

In a class, 30% of the students gave their names to participate in the NSS and 75% to participate in the NCC. Three students participate in neither of these two and six students wanted to participate in both.

4. How many students are there in the class?
(A) 100 (B) 75 (C) 60 (D) 80

5. What percentage of students wants to participate in only one programme – either NSS or NCC?
(A) 85% (B) 90% (C) 75% (D) 20%

6. How many students want to participate in at least one programme?
(A) 97 (B) 87 (C) 147 (D) 57

Directions for questions 7 to 9: These questions are based on the following information.

In a locality 60% people read the newspaper Times of India and 35% people read only the newspaper The Hindu. 10% people read both the newspapers and 240 people do not read any of the two newspapers.

7. How many people are there in that locality?
(A) 4800 (B) 2400 (C) 2000 (D) 4000

8. How many people read only Times of India?
(A) 2880 (B) 2000 (C) 2400 (D) 2800

9. How many people read at most one of the two newspapers?
(A) 4200 (B) 4400 (C) 4560 (D) 4320

Directions for questions 10 to 12: These questions are based on the following information.

In an institute, 150 students are members of "Club A", 140 students are the members of "Club B" and 165 students are the members of the "Club C". 25 students are the members of both the Clubs A and B. 35 students are the members of both the Clubs B and C and 30 students are the members of clubs A and C. 15 students are the members of all the three Clubs. Each student is a member of at least one of the Clubs.

10. How many students are not the members of Club C?
(A) 215 (B) 200 (C) 210 (D) 310

11. How many students are the members of both the Clubs A and B but not C?
(A) 10 (B) 20 (C) 15 (D) 30

12. How many students are the members of Club A or Club C?
(A) 310 (B) 320 (C) 325 (D) 285

Directions for questions 13 to 16: These questions are based on the following information.

A survey was conducted among 600 bicycle owners. It was found that 200 people had Hero Ranger, 250 people had BSA SLR and 300 people had Atlas MTB bicycles with them. Seventy of them had exactly 2 out of the 3 brands of bicycles. Each owns at least one of the three brands mentioned above.

13. How many people had all the three brands?
(A) 70 (B) 40 (C) 60 (D) 110

14. If 16 owners had only BSA SLR and Atlas MTB with them, then how many people have only Hero Ranger with them?
(A) 54 (B) 72 (C) 98 (D) 106

15. If 160 people had only BSA SLR cycles, then how many have only Atlas MTB and Hero Ranger with them?
(A) 10 (B) 20 (C) 30 (D) 50

16. How many owners have only one brand of cycle with them?
(A) 70 (B) 200 (C) 490 (D) 250

Directions for questions 17 to 20: These questions are based on the following information.

A group of people who read the three magazines – Business world (BW), Business Today (BT) and Business Standards (BS) is surveyed. 49% of the people read BW, 49% of the students read BT and 52% of the people read BS. 10% of the people read all the three. 26% read both BW and BS, 14% read only BS and BT. 15% read only BT. 20 people read only BW and BT.

17. How many people do not read BT?
(A) 64 (B) 102 (C) 92 (D) 108

18. Among the people who read BW, how many people do not read BS?
(A) 102 (B) 46 (C) 84 (D) 59

19. How many people read at least two magazines?
(A) 64 (B) 109 (C) 100 (D) 129

20. How many people read at most one magazine?
(A) 100 (B) 120 (C) 105 (D) 109

Directions for questions 21 to 23: These questions are based on the following information.

Out of a group of 315 students who went to Mumbai, 125 visited Essel World, 140 visited Lumbini Garden and 160 visited Film Nagar. Twenty Five of them visited all the three places while 200 visited exactly one of the three places. The number of students, who visited exactly 2 out of the three places, is five times as many as those who have not visited any of the places.

21. How many students visited not more than one place?
(A) 200 (B) 180 (C) 250 (D) 215

22. If the number of students who visited at least one of the two places, Lumbini Gardens and Film Nagar is 255, then how many students visited only Essel World?
(A) 45 (B) 25 (C) 125 (D) 75

23. If the number of students who visited at least one of the two places, Lumbini Gardens and Film Nagar is 255, then how many students visited only one of the two places, Lumbini Gardens and Film Nagar (and not any of the other two places)?
(A) 215 (B) 125 (C) 155 (D) 175

Directions for questions 24 to 27: These questions are based on the following information.

The following table represents the survey result which is conducted in five companies to find out the number of Engineers and the number of employees who are from Delhi.

Company Name	Engineer	Employees from Delhi	Employees who are Engineer from Delhi	Total number of employees.
Company A	125	70	45	200
Company B	320	300	250	400
Company C	130	170	130	190
Company D	220	140	130	250
Company E	145	145	105	200

24. Which company has the least number of employees who are neither Engineers nor from Delhi?
(A) Company C (B) Company D
(C) Company E (D) Company B

25. How many employees of company C are Engineers, but are not from Delhi?
(A) 10 (B) 20
(C) 15 (D) None of these

26. How many employees of company B are neither Engineers nor from Delhi?
(A) 30 (B) 20 (C) 40 (D) 50

27. How many employees of company D are either engineers or from Delhi?
(A) 250 (B) 230 (C) 130 (D) 90

Directions for questions 28 to 30: These questions are based on the following information.

In a class of 160 students, 30 students passed only in English and 40 students passed only in Maths. 32 students passed in Science and Maths and 30 students passed in Science and English. 11 students passed in all the three subjects. Every student passed in atleast one of the three subjects.

28. If the number of students who are passed in Maths is more than the number of students who are passed in Science, then what is the maximum possible number of students, who passed in only Science?
(A) 29 (B) 18
(C) 31 (D) 23

29. If the number of students who passed in Science is more than the number of students who are passed in English, then what is the maximum possible number of students, who passed in English as well as in Maths?
(A) 15 (B) 27 (C) 14 (D) 25

30. If the number of students passed in English is 68, then how many students passed in exactly one subject?
(A) 101 (B) 139 (C) 140 (D) 150

Exercise – 7(d)

Directions for questions 1 to 3: These questions are based on the following table.

Age Group	Number of Magazine Readers						Total including non-readers	
	BW		BT		Both			
	Male	Female	Male	Female	Male	Female	Male	Female
< 15 years	145	65	155	65	50	30	260	115
15 - 34 years	175	125	105	85	40	50	265	190
≥ 35 years	115	135	120	100	35	45	215	195

1. How many males in 15 - 34 years age group do not read any of the 2 magazines?
(A) 15 (B) 45 (C) 75 (D) 25

2. Approximately, what percentage of the BT readers, are above 15 years of age?
(A) 75% (B) 45% (C) 65% (D) 80%

3. What percentage of females, who read neither BT nor BW, are below 15 years of age?
(A) 30% (B) 60% (C) 40% (D) 20%

Directions for questions 4 to 7: These questions are based on the following information.

All the 1000 students at a summer camp are engaged in at least two of the activities – Painting, Swimming, Dancing, Singing or Karate. It is further known that the number of students engaged in every combination of exactly two activities is three times the number of students who are engaged in every combination of exactly three activities. Also, the number of students engaged in all the five activities is a third of that engaged in exactly four activities. The number of students engaged in every combination of exactly four activities is the same.

4. If the number of students engaged in all the five activities is 100, then the number of students engaged in only painting and karate is
(A) 150 (B) 45
(C) 450 (D) Cannot be determined

5. If the number of students engaged in exactly three activities is 1.5 times the number of students engaged in all the five activities, then which of the following is true?
(A) The number of students engaged in only swimming, dancing and painting is 15.
(B) The number of students engaged in all the five activities is 100.
(C) Both (A) and (B)
(D) Neither (A) nor (B)

6. If the number of students enrolled in painting, swimming, dancing, singing and karate are 750, 800, 400, 900 and 600 respectively, then which of the following is definitely false?
(A) The number of students engaged in only painting, dancing, singing and karate is 90.
(B) The number of students engaged in exactly two activities is 300.
(C) The number of students engaged in exactly three activities is lesser than that engaged in only dancing, singing, swimming and karate.
(D) The number of students engaged in all the five activities is 150.

7. In the previous question, if the number of students engaged in painting is not known then which of the following can be that value?
(A) 270 (B) 90 (C) 360 (D) 120

Directions for questions 8 to 10: These questions are based on the following data.

Out of a group of 245 pilgrims, 105 visited Badrinath, 95 visited Kedarnath and 95 visited Somnath. Fifteen of them visited all three shrines, while 190 visited exactly one of the three shrines. The number of pilgrims who visited exactly two out of the three shrines is three times as many as those who have not visited any one of the three shrines.

8. If the number of pilgrims who have visited at least one of the two shrines Kedarnath and Somnath is 165, then how many pilgrims visited only Kedarnath and Somnath?
(A) 20 (B) 30 (C) 10 (D) 15

9. If 180 pilgrims visited at least one of the two shrines Kedarnath or Badrinath, then how many pilgrims visited only Somnath?
(A) 55 (B) 40 (C) 35 (D) 60

10. If there is nobody who visited only Badrinath and Somnath, then how many people visited only Kedarnath?
(A) 90 (B) 80 (C) 70 (D) 50

Directions for questions 11 to 14: These questions are based on the following information.

Each of the students, who are residents of Kalpana Chawla Bhawan, likes at least one among the four different brands of cool-drinks – Coca-cola, Thums-Up, Limca and Sprite. 65 students like Thums-Up and Coca-

cola. 77 students like Sprite and Thums-Up. 73 students like Coca-cola and Limca. 76 students like Limca and Thums-Up. 74 students like Sprite and Coca-cola. There are 67 students who like exactly one brand. The number of students who like only Limca, Thums-Up and Coca-cola is same as the number of students who like only Sprite, Thums-Up and Coca-cola. The number of students who like Sprite, Limca and Thums-Up but not Coca-cola is same as the number of students who like Sprite, Limca and Coca-cola but not Thums-up. The number of students, who like only Coca-cola and Sprite is 14. The number of students who like only Sprite and Limca and only Thums-Up and Coca-cola are 10 and 15 respectively. The sum of the number of students who like Thums-Up, the number of students who like Coca-cola, the number of students who like Sprite and the number of students who like Limca is 557.

11. How many students like both Sprite and Limca but not all the four?
(A) 60 (B) 50 (C) 55 (D) 44

12. What is the total number of students?
(A) 247 (B) 250 (C) 235 (D) 252

13. How many students like only Coca-cola and Limca?
(A) 16 (B) 17 (C) 13 (D) 15

14. If 25 students like only Thums-Up or only Sprite, then how many like Coca-cola or Limca?
(A) 42 (B) 208 (C) 152 (D) 210

Directions for questions 15 to 17: These questions are based on the following data.

In a college library, four different business newspapers – Economic Times, Business Standard, Business Line and Financial Express – are available. All students visit the library regularly but 20% of them do not read any business newspaper.

The four newspapers given in the above order are read by 230, 180, 180 and 220 students respectively. The number of students reading exactly 2 newspapers for any two newspapers is 20. There are 30 students who read all the four newspapers but there is nobody who reads exactly three out of the four newspapers.

15. How many students do not read any newspaper at all?
(A) 75 (B) 100 (C) 225 (D) 150

16. What percentage of the people reading Business Standard also read at least one other newspaper?
(A) 35% (B) 55% (C) 50% (D) 65%

17. If all the students in the college including those who do not read any newspaper read at least one newspaper, (out of the four newspapers above) which he is not reading at present, then what is the least number of students reading all the four newspapers?
(A) 60 (B) 25 (C) 15 (D) 30

Directions for questions 18 to 21: These questions are based on the following data.

A survey of 300 respondents showed that 135 of them read Business India, 125 read Business Today and 115 read Business World. Further, 42 of the respondents read Business India and Business Today, 48 read Business Today and Business World, 43 read Business India and Business World and 30 of the respondents read all the three magazines.

18. How many respondents read Business India or Business World?
(A) 199 (B) 272 (C) 207 (D) 175

19. If seven of the respondents who were previously reading only Business India now start reading a second magazine also and five of the respondents who were previously reading only Business India now stop even that, then how many respondents read Business India now?
(A) 75 (B) 132 (C) 142 (D) 130

20. If 15 respondents who were reading Business India stop reading Business India and start reading Business Today, then what is the maximum number of respondents who will now be reading only Business India?
(A) 120 (B) 65 (C) 78 (D) 93

21. If 16 of the respondents, who were reading Business Today, stop reading Business Today and instead start reading Business World, then what is the maximum number of respondents who will now be reading Business India and Business World?
(A) 59 (B) 55 (C) 75 (D) 63

Directions for questions 22 to 24: These questions are based on the following data.

In a colony, a survey was conducted regarding the ownership of three different types of vehicles – car, scooter and bicycle.

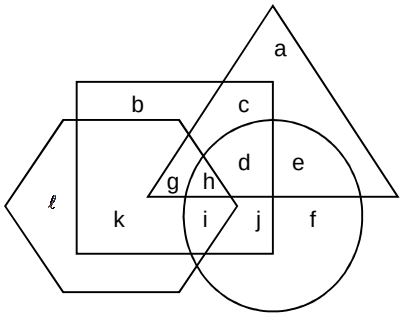
- The number of residents owning all three vehicles is the same as those owning none.
- The number of residents owning any two out of the three vehicles is the same as those owning any other two which in turn is the same as those owning none of the three.
- The number of residents owning scooters alone is the same as those owning cars alone and each in turn is twice those owning bicycles alone.
- Half the number of residents who own a bicycle also own at least one of the other two vehicles.

22. If the number of residents who own only bicycles is 150, then what is the total number of residents in the colony?
(A) 500 (B) 1000
(C) 750 (D) 1250

23. If 15 residents do not own any of the three vehicles, then how many residents are there in the colony?
(A) 100 (B) 200
(C) 500 (D) 300

24. What percentage of the residents own a scooter or a car but not a bicycle?
(A) 65% (B) 55%
(C) 75% (D) 45%

Directions for questions 25 to 27: These questions are based on the following diagram.



The circle represents the people who are Hindus.
The triangle represents the people who are members of a club.
The quadrilateral represents the people, who are Actors.
The hexagon represents the people, whose mother tongue is Hindi.

25. Which of the following represents the people who are Hindus, club members, actors and whose mother tongue is Hindi?
(A) i (B) h (C) j (D) d

26. Which of the following represents the people who are not Hindus but are members of a club and actors?
(A) g, c (B) c, a (C) g, k (D) c, g, a

27. Which of the following represents the people, who are Hindu but are not the members of a club, are not actors and whose mother tongue is not Hindi?
(A) j (B) a (C) f (D) i

Directions for questions 28 to 30: These questions are based on the following data.

A survey was conducted among 300 Room air conditioner owners. It was found that 125 people had Carrier Aircon, 145 people had Voltas and 90 people had Fedders Lloyd air conditioners with them. Thirty two of them had exactly two out of the three brands of air conditioners and each person owns atleast one of the three brands.

28. If six owners had only Voltas and Fedders Lloyd air conditioners with them, then how many have only Carrier Aircon with them?
(A) 125 (B) 65 (C) 45 (D) 85

29. If 110 owners had only Voltas air conditioners, then how many have only Carrier Aircon and Fedders Lloyd with them?
(A) 11 (B) 17 (C) 8 (D) 23

30. If ten of the owners having only Carrier Aircon now buy Voltas also, and 5 of the owners who had only Voltas and Fedders Lloyd now buy Carrier Aircon also, then how many have at least two out of the three brands of air conditioners?
(A) 19 (B) 61 (C) 56 (D) 73

Key

Exercise – 7(a)

1.	C	6.	C	11.	C	16.	D	21.	D	26.	D
2.	D	7.	D	12.	B	17.	C	22.	A	27.	C
3.	D	8.	D	13.	B	18.	B	23.	C	28.	B
4.	B	9.	B	14.	D	19.	B	24.	B	29.	A
5.	D	10.	D	15.	D	20.	A	25.	D	30.	A

Exercise – 7(b)

1.	C	6.	B	11.	B	16.	D	21.	B	26.	C
2.	B	7.	A	12.	C	17.	B	22.	A	27.	B
3.	D	8.	B	13.	D	18.	B	23.	C	28.	A
4.	D	9.	D	14.	D	19.	C	24.	A	29.	D
5.	C	10.	C	15.	A	20.	D	25.	C	30.	D

Exercise – 7(c)

1.	A	6.	D	11.	A	16.	C	21.	D	26.	A
2.	D	7.	A	12.	D	17.	B	22.	A	27.	B
3.	C	8.	C	13.	B	18.	B	23.	C	28.	A
4.	C	9.	D	14.	D	19.	C	24.	C	29.	D
5.	A	10.	A	15.	B	20.	A	25.	D	30.	A

Exercise – 7(d)

1.	D	6.	C	11.	A	16.	C	21.	B	26.	A
2.	C	7.	A	12.	D	17.	D	22.	B	27.	C
3.	A	8.	C	13.	C	18.	C	23.	D	28.	D
4.	B	9.	A	14.	D	19.	D	24.	A	29.	A
5.	C	10.	D	15.	D	20.	C	25.	B	30.	C