Venn Diagrams
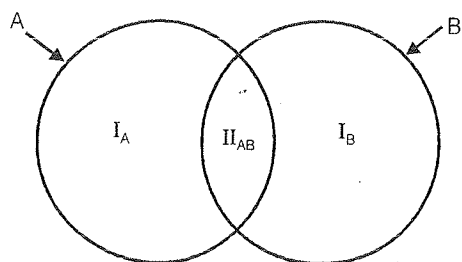
Venn Diagrams are pictorial way of representation of a set of articles. There are different regions which needs proper understanding for solving problems based on logical venn diagrams.

Case I : When there are only two articles

Here I_A represents A only. (i.e. not B)

I_B represents B only (i.e. not A)
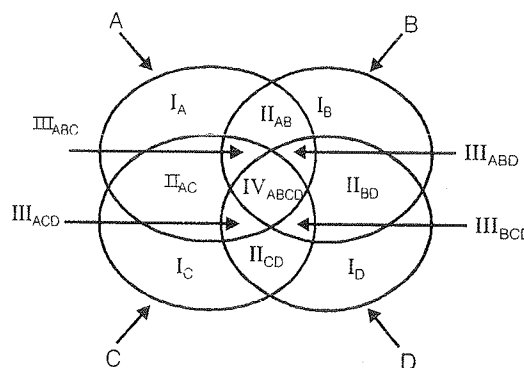
II_{AB} represents A and B only i.e. both A and B.

Case II : When there are only three articles
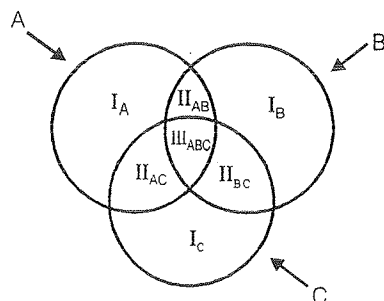
Here I_A represent A only (not B or C)

I_B represents B only (not A or C)

I_C represents C only (not A or B)

II_{AB} represents A and B only (not C)

II_{BC} represents B and C only (not A)

II_{AC} represents C and A only (not B) and

III_{ABC} represents A, B and C only i.e. region which is common to A, B and C.

**Case III :** When there are only four articles

I_A represents A only (not B, C or D)

I_B represents B only (not A, C or D)

I_C represents C only (not A, B or D)

I_D represents D only (not A, B or C)

II_{AB} represents A and B only (not C or D)

II_{AC} represents A and C only (not B or D)

II_{BD} represents B and D only (not A or C)

II_{CD} represents C and D only (not A or B)

III_{ABC} represents A, B and C only (not D)

III_{BCD} represents B, C and D only (not A)

III_{ACD} represents A, C and D only (not B)

III_{ABD} represents A, B and D only (not C)

IV_{ABCD} represents A, B C and D all.

i.e. region which is common to all A, B, C and D.

Note: A, B, C and D can be represented in form of a triangle, circle, rectangle or square. The logic behind venn diagram will remain unchanged irrespective of the type of figure.

□□□□

1. The triangle, square and circle shown below represent, the urban, hard working and educated people respectively. Which one of the areas marked I-VII is represented by the urban educated people who are not hard working?
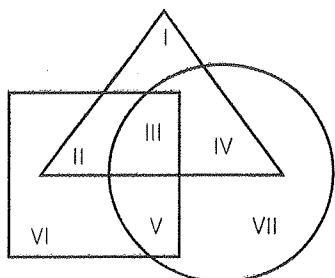
(a) II   (b) I
(c) IV   (d) III

Direction (Qs. 2 to 5): The figure given below consists of three interesting circles which represent sets of students who play Tennis, Badminton and Volleyball. Each region in the figure is represented by a small letter.
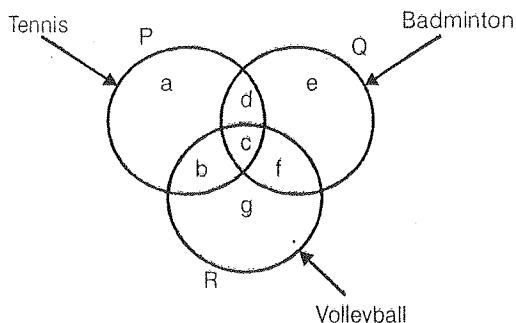
On the basis of the above figure, answer the questions given below.

2. Which letter represents the set of persons who play all the three games?
(a) b   (b) c
(c) f   (d) g

3. Which letter represents the set of persons who play Tennis and Volleyball but not Badminton?
(a) g   (b) e
(c) c   (d) b

4. Which letter represents the set of persons who play Tennis but neither Badminton nor Volleyball?
(a) a   (b) b
(c) c   (d) d

5. Which letter represents the set of persons who play Tennis and Badminton but not Volleyball?
(a) b   (b) d
(c) c   (d) f

6. In the given figure, the triangle represents girls, the square represents sports persons and the circle represents coaches. The portion in the figure which represents girls, who are sports persons but not coaches is the one labelled
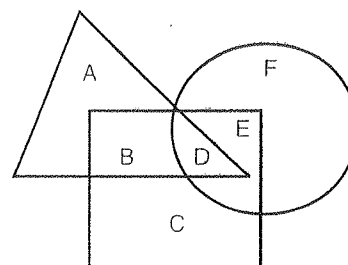
(a) A   (b) B
(c) D   (d) E

Direction (Qs. 7 to 11) : Below is given a figure with four intersecting circles, each representing a group of persons having the quality written against it. Study the figure carefully and answer the questions that follow.
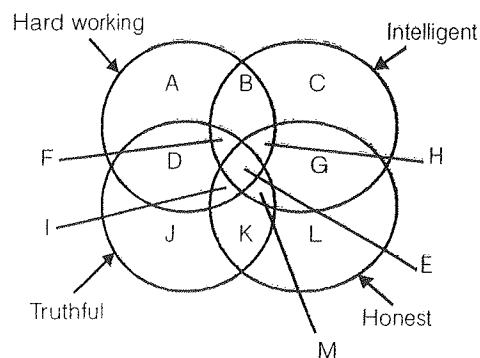
7. The region which represents the people who are intelligent, honest and truthful but not hard working is denoted by
(a) E   (b) F
(c) M   (d) I

8. The people possessing all the qualities are represented by
(a) I   (b) H
(c) F   (d) E

9. The region which represents people who are not honest but possess all other three qualities, is denoted by
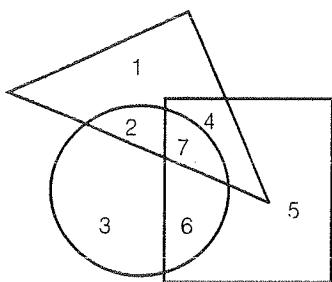(a) B   (b) d
(c) F   (d) I

10. People who are not hard working, intelligent and truthful are represented by
    (a) G   (b) H
    (c) K   (d) L

11. People who are not honest and truthful but are hard working and intelligent both, are represented by
   (a) E   (b) B
    (c) M   (d) I

12. If Tall is equivalent to circle, Armymen to triangle and Strong to square, indicate which number will represent strong armymen?

    (a) 3   (b) 4
    (c) 5   (d) 6

Direction (Qs. 13 to 15): The following questions are based on the diagram given below. In the diagram, the triangle stands for graduates, square stands for membership of professional organisation and the circle stands for membership of social organisation. Read each statement and find out the number (s) to represent the people covered by the given statement.
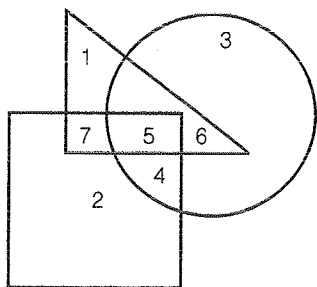
13. Number of graduates in social organisations
   (a) 1   (b) 5
    (c) 6   (d) 5 and 6

14. Number of a graduates in social organisations only
    (a) 3   (b) 4
    (c) 5   (d) 6

15. Number of graduates in professional organisation
    (a) 5 and 7   (b) 5, 6 and 7
    (c) 6 and 7   (d) 4, 5 and 6

16. In the following diagram, square represents women, triangle represents sub-inspectors of police and circle represents graduates. Which numbered area represents women graduate sub-inspector of police?
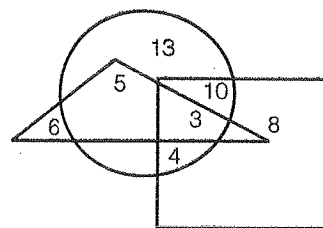
    (a) 5   (b) 3
    (c) 8   (d) 13

17. The diagram below represents the student who study Physics, Chemistry and Mathematics. Study the diagram and identify the region which represents the students who study Physics and Mathematics but not Chemistry.
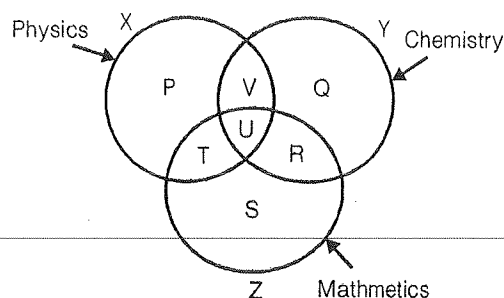
    (a) T
    (b) P + T + S
    (c) V
    (d) P + T + S + R + U + V

Direction (Qs. 18 to 25) : The following questions are based on the diagram given below:
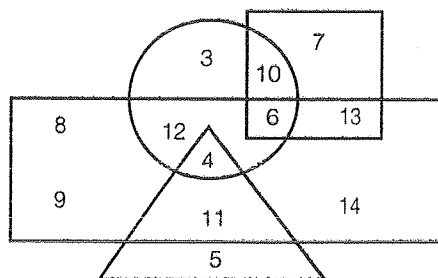
    (1) Rectangle represents males
    (2) Triangle represents educated
    (3) Circle represents urban
    (4) Square represents civil servants

18. Who among the following is an educated male who is not an urban resident?
    (a) 4
    (b) 5
    (c) 9
    (d) 11

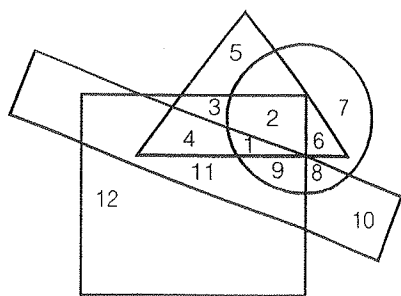19. Who among the following is neither a civil servant nor educated but is urban and not a male?
    (a) 2
    (b) 3
    (c) 6
    (d) 10

20. Who among the following is a female, urban resident and also a civil servant?
    (a) 6
    (b) 7
    (c) 10
    (d) 13

21. Who among the following is an educated male who hails from urban area?
    (a) 4
    (b) 2
    (c) 11
    (d) 5

22. Who among the following is uneducated and also an urban male?
    (a) 2
    (b) 3
    (c) 11
    (d) 12

23. Who among the following is only a civil servant but neither a male nor urban oriented and uneducated?
    (a) 7
    (b) 8
    (c) 9
    (d) 14

24. Who among the following is a male, urban oriented and also a civil servant but not educated?
    (a) 13
    (b) 12
    (c) 6
    (d) 10

25. Who among the following is a male civil servant, who is neither educated nor belongs to urban area?
    (a) 7
    (b) 13
    (c) 4
    (d) 1

Direction (Qs. 26 to 35): In the following figure, the circle stands for employed, the square stands for hard working, the triangle stands for rural and the rectangle stands for intelligent. Study the figure carefully and answer the questions that follow.

26. Non-rural, employed, hard working and intelligent people are indicated by region
    (a) 8
    (b) 9
    (c) 10
    (d) 11

27. Non-rural, employed people who are neither intelligent nor hard working are represented by region
    (a) 12
    (b) 11
    (c) 10
    (d) 7

28. Intelligent, employed and hard working non rural people are indicated by region
    (a) 11
    (b) 6
    (c) 9
    (d) 4

29. Hard working non-rural people who are neither employed nor intelligent are shown in region
    (a) 8
    (b) 7
    (c) 6
    (d) 12

30. Employed, hard working and intelligent rural people are indicated by region
    (a) 1
    (b) 2
    (c) 3
    (d) 4

31. Rural hard working people who are neither employed nor-intelligent are indicated by region
    (a) 6
    (b) 5
    (c) 4
    (d) 3

32. Rural employed people who are neither intelligent nor hard working are indicated by region
    (a) 2
    (b) 4
    (c) 6
    (d) 9

33. Rural people who are hard working and employed but not intelligent are indicated by region
    (a) 1
    (b) 2
    (c) 3
    (d) 4

34. Unemployed rural hard working and intelligent people are indicated by region
    (a) 1
    (b) 2
    (c) 3
    (d) 4

35. Rural employed people who are neither intelligent nor hard working are indicated by region
    (a) 10
    (b) 9
    (c) 6
    (d) 4

Solutions

1. (c) The required region is the one which is common to the triangle and the circle but is not a part of the square i.e. IV.

2. (b) The required region is the one common to all the three circles i.e. c.

3. (d) The required region is the one which is common to circles P and R but is not a part of circle Q i.e. b.

4. (a) The required region is the one which lies inside circle P but is not common to circle Q or circle R or both i.e. a.

5. (b) The required region is the one which is common to circles P and Q but lies outside circle R i.e. d.

6. (b) The required region is the region which is common to the triangle and square but lies outside the circle i.e., B.

7. (c) The required region is the one which is common to the circles 2, 3 and 4 but is not a part of circle 1 i.e. M.

8. (d) The required region is the one which is common to all the four circles i.e. E.

9. (c) The required region is the one which is common to the circles 1, 2 and 4, but lies outside circle 3 i.e., F.

10. (d) The required region is the one which does not lie inside circles 1, 2 and 4 i.e. L.

11. (b) The given conditions are satisfied by the persons denoted by the region which is common to circles 1 and 2 but is not a part of either circle 3 or circle 4 i.e. B.

12. (b) Strong armymen will be represented by the region which is common to the square and the triangle but lies outside the circle i.e. 4.

13. (d) The required region is the one common to the circle and triangle i.e regions 5 and 6

14. (d) The required region is the one common to the triangle and circle but lies outside the square i.e. 6.

15. (a) The required region is the one common to the triangle and square i.e. regions 5 and 7.

16. (b) The required region is the one common to the square, triangle and circle i.e. 3.

17. (a) The required region is the one which is common to circles X and Z but lies outside circles Y. i.e. T.

18. (d) The person satisfying the given conditions is represented by the region which is common to the triangle and the rectangle but lies outside the circle i.e. 11.

19. (b) The person satisfying the given conditions is represented by the region which lies inside the circle but outside the square, the rectangle and the triangle i.e. 3.

20. (c) The person satisfying the given conditions is represented by the region which lies outside the rectangle and is common to the circle and the square i.e. 10.

21. (a) The person satisfying the given conditions is represented by the region which is common to the triangle and the rectangle and also lies inside the circle i.e. 4.

22. (d) The person satisfying the given conditions is represented by the region which lies outside the triangle and is common to the circle and the rectangle i.e. 12.

Remember: The condition which is not mentioned shouldn't be considered or assumed. For instance, here, 6 also denotes the required region. But since it lies inside the square and there is no mention of 'civil servant', so it cannot be the answer.

23. (a) The person satisfying the given is denoted by the region which lies inside the square but outside the circle, rectangle and triangle i.e. 7.

24. (c) The person satisfying the given conditions is denoted by the region which is common to the rectangle, circle and the square but lies outside the triangle i.e. 6.

25. (b) The person satisfying the given conditions is represented by the region common to the rectangle and the square but lying outside the triangle and the circle i.e. 13.

26. (b) The required set of people is represented by the region which lies outside the triangle and is common to the circle, square and rectangle i.e. 9.

27. (d) The required set of people is represented by the region which lies outside the triangle, inside the circle but outside the rectangle and the square i.e. 7.

28. (c) The required set of people is represented by the region which is common to the rectangle, circle and square but lies outside the triangle i.e. 9.

29.(d) The required set of people of denoted by the region which lies inside the square but outside the triangle, circle and rectangle i.e. 12.

30.(a) The required set of people is denoted by the region common to the circle, square, rectangle and triangle i.e. 1.

31.(d) The required set of people is represented by the region which is common to the triangle and the square but lies outside the circle and rectangle i.e. 3.

32.(c) The required set of people is denoted by the region which is common to the triangle and the circle, but is not a part of either the rectangle or the square i.e. 6.

33.(b) The required set of people is represented by the region which is common to the triangle, square and circle but is not a part of the rectangle i.e. 2.

34.(d) The required set of people is represented by the region which lies outside the circle and is common to the triangle, square and rectangle i.e 4.

35.(c) The required set of people is denoted by the region which is common to the triangle and circle but is not a part of either the rectangle or the square i..e 6.