LOGICAL CONNECTIVES

DRILL 1: SOLUTIONS

a. *Category :* **A**

i.Whenever my father goes on a business trip, I get a gift

X->Y

Y'->X'

Category : **C**

ii.Only if Vijay clears his arrears, he will get money to start a business.

X'->Y'

Y->X

Category : **A**

iii. Raja's parents will buy him a cycle if he gets a rank.

X->Y

Y'->X'

Category : **A**

iv. I will buy a car or a house.

X'->Y

Y'->X

---

b.

i. Rajiv will get the first rank or win dance competition.

Narrate Negation 1: Rajiv didn't win first rank and didn't win

Narrate Negation 2: Rajiv didn't win and didn't get the first rank.

ii. If it rains, I will play chess.

Narrate Negation 1: It is raining and I am not playing chess.

Narrate Negation 2: I am not playing chess even though it is raining.

iii. Deepak will get his distinction only if he passes all his subjects.

Narrate Negation 1: He does not pass in all and doesn't get a distinction.(False)

Narrate Negation 2: He gets distinction and he doesn't pass (False)

---

c.

i. If I get a promotion, my salary will go up or I will get a car

Category A

Imp1: X=>(Y or Z)

X=>Y

Imp2: X=>Z
Imp3: (Y or Z)'=>X'
Imp4: Y' & Z' =>X'
Narrate Imp1: I got promotion and my salary increased
Narrate imp2: I got promotion and I got a car
Narrate imp3: My salary has not gone up and I didn't get a car, because I didn't get promotion.

ii.If it rains there will be water logging of roads and there will be a traffic jam.
Category A
Imp1: X=>(Y or Z)
Imp2: (Y and Z)'=>X'
Y' or Z'=>X'
Imp3: Y'=>X'
Imp4: Z'=>X'
Narrate imp1: It is raining, so there will be water logging of the road and traffic jam.
Narrate imp2: There is no water logging of the road, so it's not raining.
Narrate imp3: There is no traffic jam since it's not raining

DRILL 2

a.

✓ ✗
All Actors are Dancers
✓ ✗
All Singers are Dancers

The middle term dancer has not been distributed even once so we can't derive a conclusion.

b.

✓ ✗
All As are Bs
✗ ✓
Some Cs are not Bs

The conclusion should be particular as well as negative because of the second premise and the middle term B has also been distributed once so a conclusion is possible.

c.

✓ ✗
All heroes are actors
✗ ✗
Some actors are villains

Middle term actors have not been distributed once, so no conclusion.

d.

Some students are cricket players.
Some students are not hockey players.
Since there are two particular premises, we can't derive a conclusion.

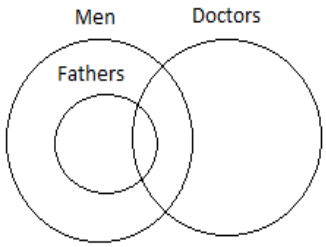
---

e. ✗ ✗
Some angels are good-natured
✓ ✗
All angels are gods
Middle term angels have been distributed once, so a conclusion is possible.

---

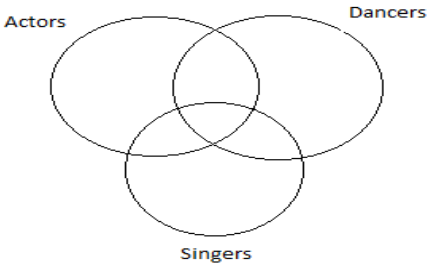
f. Men, Father & Doctor

i.



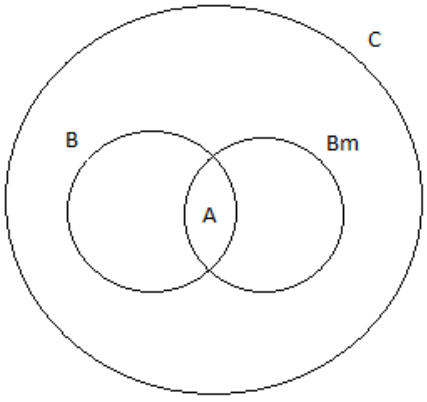
Actors, Dancers &Singers

ii.



Cricketers, Batsman, bowlers and All rounder.

iii.



Cricketers(C), Bowlers(B), Batsman(Bm), Allrounders(A)

DRILL 3

a.

i) The students who have failed in all three subjects are **15**
ii) The students who have passed in at least 2 subjects are 12+22+15+11=**60**
iii) Students who have passed in Physics are 30+22+11+15=**78**
iv) Students who have passed in Maths and Chemistry are 12+11=**23**

---

b.

i) Students who pursue Yoga as their hobby are 6+15+18+17+31+21+15+9=**132**
ii) Students who pursue exactly 3 hobbies: 18+23+15+21 =**77**
iii) Students who pursue at most one hobby are: 12+15+8+25=**60**
iv) Students who pursue all 4 hobbies are **37**.

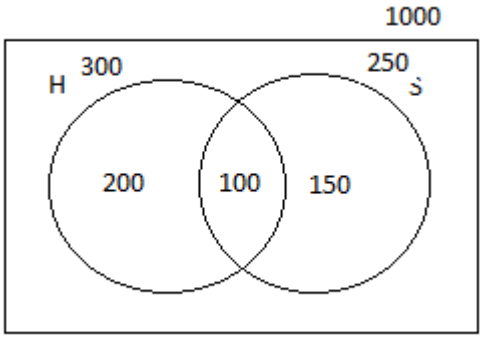
---

c.

i) Students who pursue Basketball and Cricket 12+15+14=**41**
ii) Students play football and hockey alone: **0**
iii) Students who play basketball, football and hockey are 15+21=**36**

DRILL 4

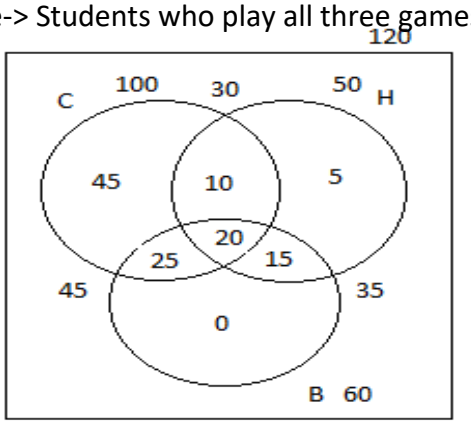
a) Total no of families: 1000
Families who subscribe to Hindustan = 300
Families who subscribe to the Statesman =250
Families who subscribe to both =100



Families who subscribe to only the Hindustan=300-100=200
Families who subscribe to only Statesman newspaper=250-100=150
Number of families who subscribe to at least any one of the papers=200+100+150=450
Hence the number of families who can subscribe to none=1000-450=**550**
This can also be solved by framing equations.

.

b) Total number of Students=120
S->Students who are playing only one game
d-> Students who are playing any of two games
e-> Students who play all three games



1s+2d+3e=100+60+50=210 → (1)
1s+1d+1e=120 → (2)
1d+2e=210-120=90 → (3)
1d+3e=30+35+45=110→ (4)
Hence, e=20
Students who play all 3 games=20

i. No of students playing at least 2 games =10 +20+15+25=**70**
ii. No of students who play at most 1 game =45+5+0=**50**
iii. No of students who play all 3 games=**20**
iv. No of students playing cricket and basketball alone=**25**

GOOGLY QUESTIONS

1. **Wrong.**
The given solution is wrong because there seems to be no intersection between cricketers set and the football players set whereas in reality, there could be a set of people who play both cricket and football.

2. **Wrong**
The statement" 120 students speak Hindi alone" is converted to the equation "a + b=120".This is incorrect because in a + b, b indicates people who can speak both Hindi and English which is inconsistent with the given statement. Hence the solution will also be incorrect as it is solved using equations.

3. **Wrong**.

The given statement is a combination of categories A and B. In the solution given, it is mentioned as
If X, Y or Z means X=>Y or Z and (Y' or Z') =>Y
The second conclusion is wrong and should have been (Y or Z)'=>X'
Or Y' and Z' =>X'
Hence the first conclusion is correct and the other two are incorrect.

---

4. Wrong.
Though the conclusion has to be particular and negative, it has to be according to the following guidelines as we are to ensure consistency. In the conclusion, rabbits should be distributed and cats should be particular whereas it is not so in the answer given.

---

5. Correct.

CONCEPT REVIEW QUESTIONS

1. I get mouth ulcers whenever examinations are round the corner.
   So conclusions are X=>Y and Y'=>X'

Ans (c)

---

2. The current Indian team is considered best only if it wins the world cup.

Ans (c)

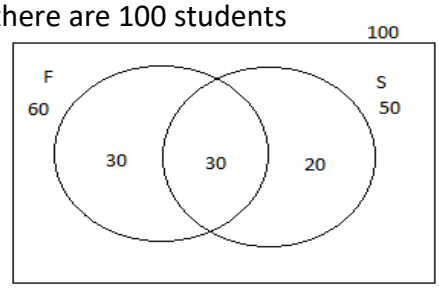
---

3. I have fond memories every time I see my childhood photographs.
   I don't have fond memories, I didn't see my photos.

Ans (b)

---

4. So totally there are 100 students



Students who failed in both subjects =100-(30+30+20) =20

Ans (d)

5. ✓ ✗
All cars are bikes
✓ ✗
All bikes are trains
Middle term is distributed once so we will get conclusion.
The conclusion will be All cars are trains which is not given in any option so the
Ans (d)

6. ✓ ✓
No chocolate is a toffee
✓ ✗
All sweets are toffees
Middle term is distributed once so we will get the conclusion.
Conclusion: No chocolate is a sweet
Ans (a)

7. If there is an earthquake, there will be massive destruction and loss of lives
IF X, Y and Z
X=>(Y or Z)
Y' or Z'=>X'
If there are no loss of lives, no earthquake has occurred – Y'=>X'
Ans (c)

8. India can become a superpower only if it can stop bribery.
Conclusion: Y=> X –India has become a superpower, so, it must have stopped bribery
X'=>Y' –India has not stopped bribery so it will not become a superpower
Ans (c)

9. If it is monsoon season, there will be heavy winds or rainfall.
Conclusion: X =>Y or Z
Y' or Z' =>X'
Ans (c)

10. Numbers divisible by 6 :200%6=33
Numbers divisible by 8:200%8=25
But we need to remove common numbers divisible by both 6 and 8.LCM (6, 8)=24
Common numbers divisible by both 6 and 8=200%24=8.Total numbers divisible by 6 or 8=58-8=**50**
Ans (a)

11. Option B) Some heroes are villains; All villains are bad; Some heroes are bad.
One Particular premise =>Particular conclusion; Middle terms villain has been distributed once so the rules are satisfied and the conclusion is correct.
Ans (b)

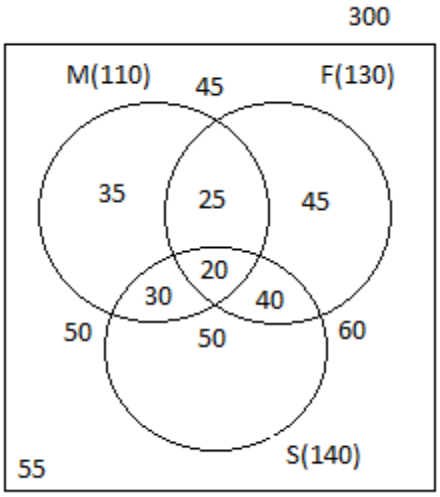
12. Option (C) One particular premise => particular conclusion, middle term men has been distributed once.
Ans (c)

13. Option d**)** All sincere people are fat, All fat people are good natured, All sincere people are good-natured.
Ans (d)

14. In the statements we have to look for the option where the third statement can be logically deduced from the first and the second.
Going by the options, option (a) CEB gives us the right answer
Ans (a)

15.
i. No war is fair
ii. Some love is fair
In the first premise both war and fair are distributed so both ticks, in the second premise love and fair are both not distributed.
Conclusion should be particular and should be negative too.
The only option is (d) which supports the above statement.
Ans (d)

16. No conclusion is possible since we are having 2 particular statements.



Ans (d)

17. F and S and M =300-55 –(110+130+140-45-50-60)=20
No of people who chose all subjects=**20**
Ans (a)

18. 300-{55+20+95}=**20**
Ans

19. At least 2 subjects : 155-2(20)=**115**
Ans (b)

20. Finance and systems only : 60-20=**40**
Ans (b)