LOGICAL REASONING HANDOUT
(Logical Connectives)
Ref: LRHO1002011

<table>
<thead>
<tr>
<th>Logical Connectives</th>
<th>Implications</th>
<th>Negations</th>
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<tbody>
<tr>
<td>If p, then q</td>
<td>p ⇒ q</td>
<td>p &amp; ~q</td>
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<tr>
<td></td>
<td>~q ⇒ ~p</td>
<td>~q &amp; ~p</td>
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<tr>
<td>Whenever p, then q</td>
<td>~p ⇒ q</td>
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<td></td>
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<tr>
<td>Either p or q</td>
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Directions for questions 1 to 5: Each question below consists of a main statement followed by four numbered statements. From the numbered statements, select the one that logically follows the main statement.

1. If he conserves energy, then he wins the race.
   (A) He won the race, implies he conserved energy.
   (B) He did not conserve energy, implies he did not win the race.
   (C) He conserved energy means he did not win the race.
   (D) He did not win the race, implies he did not conserve energy.

2. Whenever Virat hits a six, I feel elated.
   (A) Virat did not hit a six, hence I did not feel elated.
   (B) I felt elated, means that Virat hit a six.
   (C) I did not feel elated, means that Virat did not hit a six.
   (D) I felt elated, mean Virat did not hit a six.

3. Either the child plays or it cries.
   (A) The child is not crying means that the child is not playing.
   (B) The child is playing, implies that it is crying.
   (C) The child is not playing, implies that it is not crying.
   (D) The child is not crying implies that it is playing.

4. Only if the monsoon arrives on time, then the crops grow.
   (A) Crops are not growing, implies the monsoon did not arrive on time.
   (B) Crops are growing, means that the monsoon arrived on time.
   (C) The monsoon arrived on time, hence crops are growing.
   (D) Crops are not growing, therefore the monsoon arrived on time.

5. Unless the infrastructure is developed, the economy cannot grow.
   (A) The infrastructure has been developed, implies economy will grow.
   (B) Economy has not grown, means that the infrastructure has been developed.
   (C) Economy has grown, therefore the infrastructure has not been developed.
   (D) Economy has grown, hence the infrastructure has been developed.

Directions for questions 6 to 11: In each question, there is a main statement followed by four statements a, b, c and d. From the choices, choose the ordered pair where the first statement implies the second statement and the two are logically consistent with the main statement.

6. If it is a Sunday, then I watch a movie.
   (a) It is not a Sunday.
   (b) I did not watch a movie.
   (c) It is a Sunday.
   (d) I watched a movie.

7. I take leave, whenever my boss is angry.
   (a) I took leave.
   (b) My boss is not angry.
   (c) I did not take leave.
   (d) My boss is angry.

8. Either it is raining or I will go to a movie.
   (a) It is raining.
   (b) It is not raining.
   (c) I will go to a movie.
   (d) I will not go to a movie.

9. Unless I receive money from my father, I will not pay my bills.
   (a) I have paid my bills.
   (b) I received money from my father.
   (c) I have not paid my bills.
   (d) I have not received money from my father.

10. Only if an alliance is formed, the parliament can be constituted.
    (a) The parliament cannot be constituted.
    (b) An alliance is formed.
    (c) An alliance is not formed.
    (d) The parliament is constituted.

11. He will go to the temple, only if it is a holiday.
    (a) It was a holiday.
    (b) He will not go to the temple.
    (c) He went to the temple.
    (d) It was not a holiday.
Directions for questions 12 to 17: Each question given below is a statement followed by different statements. Choose the one which is the correct negation of the given statement.

12. If the phone rings, the internet connection snaps.  
(A) The phone rang and the internet connection did not snap.  
(B) The phone did not ring and the internet connection did not snap.  
(C) The internet connection snapped and the phone rang.  
(D) The internet connection snapped, but the phone did not ring.

13. Whenever Rohit bats, audience watch spell bound.  
(A) Rohit is not batting but the audience are watching spell bound.  
(B) Rohit is not batting and the audience are not watching spell bound.  
(C) Rohit is batting and the audience are watching spell bound.  
(D) Audience are not watching spell bound even though Rohit is batting.

14. Either the milk is hot or the coffee is cold.  
(A) The milk is hot but the coffee is not cold.  
(B) The coffee is cold and the milk is not hot.  
(C) The milk is hot but the coffee is cold.  
(D) Neither the milk is hot nor the coffee is cold.

15. Unless I qualify in the CAT exam, I will not be able to join the IIMs.  
(A) I could not join the IIMs because I did not qualify in the CAT exam.  
(B) I qualified in the CAT exam and joined the IIMs.  
(C) I joined the IIMs, although I did not qualify in the CAT exam.  
(D) I did not qualify in the CAT exam, hence I am not joining the IIMs.

16. I will buy the trouser, only if the shirt is given free.  
(A) The shirt is not given free, hence I will not buy the trouser.  
(B) I bought the trouser, means that the shirt was given free.  
(C) The shirt is not given free, yet I will buy the trouser.  
(D) The shirt was given free, yet I did not buy the trouser.

17. Shashi will play cricket and he will study.  
(A) Shashi will neither play cricket nor study.  
(B) Shashi will play cricket but will not study.  
(C) Shashi will study but will not play cricket.  
(D) Shashi will not play cricket or will not study.

Directions for questions 18 to 25: Each question below consists of a main statement followed by four numbered statements. From the numbered statements, select the one that logically follows the main statement.

18. If it is a holiday, then I will go to a movie or I will visit my cousin.  
(A) I will not go to a movie or I will not visit my cousin, implies that it is not a holiday.  
(B) It is not a holiday, implies that I will not go to a movie and I will not visit my cousin.  
(C) I will not go to a movie and I will not visit my cousin implies that it is not a holiday.  
(D) It is not a holiday, means that I will not go to a movie or I will not visit my cousin.

19. If it is cloudy outside, then I will carry an umbrella with me and I will return home by lunch time.  
(A) I will not carry an umbrella with me or I will not return home by lunch time means that it is not cloudy outside.  
(B) It is not cloudy outside means that I will not carry an umbrella with me and I will not return home by lunch time.  
(C) I will carry an umbrella with me or I will return home by lunch time means that it is cloudy outside.  
(D) It is not cloudy outside implies that I will not carry an umbrella with me or I will not return home by lunch time.

20. If Kohli bats well or Ashwin bowls well, then India will win.  
(A) Kohli did not bat well and Ashwin did not bowl well, implies that India will lose.  
(B) Kohli batted well but Ashwin did not bowl well means that India will lose.  
(C) India won, therefore either Kohli batted well or Ashwin bowled well.  
(D) India lost, implies that neither Kohli batted well nor Ashwin bowled well.

21. If weather is good and the astronauts are fit to fly, then the spacecraft will be launched.  
(A) The weather is good and the astronauts are not fit to fly, therefore the spacecraft will be launched.  
(B) Spacecraft was not launched, means that the weather was not good and the astronauts were not fit to fly.  
(C) Spacecraft was launched, implies that either the weather was good or the astronauts were fit to fly.  
(D) Spacecraft was not launched, implies that either the weather was not good or the astronauts were not fit to fly.

22. Only if the horse runs, the cats bark or the dogs purr.  
(A) The cats barked, means that the horse ran.  
(B) The horse did not run, means that the dogs did not purr.  
(C) The dogs purred, means that the horse ran.  
(D) All the above.

23. I will buy a bike, only if I pass with good marks and get scholarship  
(A) I did not buy a bike, means I neither passed with good marks nor got scholarship.  
(B) I got scholarship implies that I will buy a bike.  
(C) I did not pass with good marks implies that I will not buy a bike.  
(D) I bought a bike means either I passed with good marks or got scholarship.

24. Unless I am an Engineer, I can apply to neither IIT nor NITIE.  
(A) I am an Engineer, hence I can apply to IIT and NITIE.  
(B) I can apply to NITIE, therefore I must be an Engineer.  
(C) I am an Engineer, means that I cannot apply to IIT or NITIE.  
(D) I am an Engineer means, I can apply to either IIT or NITIE.

25. I will not succeed, unless I work hard or plan diligently.  
(A) I did not succeed, means that I neither worked hard nor planned diligently.  
(B) I am working hard and planning diligently, implies that I will succeed.  
(C) I plan diligently but cannot work hard, means I cannot succeed.  
(D) I succeeded but I did not plan diligently, means that I worked hard.