

HiLCoE

School of Computer Science & Technology

Using the rules of inferences check the validity of each of the following arguments.

1. Write each of the following statements in to symbolic form using quantifiers.
 - a) Not all athletes are businessmen.
 - b) Some athletes are businessmen.
 - c) Some athletes are not businessmen.
 - d) None of the athletes are businessmen.
 - e) All athletes are businessmen.
 - f) No athlete is a businessman.
 - g) All athletes are not businessmen.
2. a) $p \Rightarrow q, p, r \Rightarrow q \vdash r$ b) $\neg p \wedge \neg q, (q \vee r) \Rightarrow p \vdash \neg r$
c) $\neg q \Rightarrow \neg p, r \Rightarrow p, \neg q \vdash r$ d)
3. Whenever he participates in a competition, he is the winner. Either he participates in the competition or he is sick. He is not the winner. Therefore he is sick.
4. If I wake up early, I go to gymnasium. Either it is Sunday or I don't go to gymnasium. But it is not Sunday. Therefore I didn't wake up early.
5. Whenever Arsenal wins, Raymond is happy. If he is happy, he drinks too much. Raymond drinks too much only if he is arguing with his wife. Raymond did not argue with his wife. Therefore Arsenal won.
6. If Abdela attended the graduation party, then he would have drink tea. If he went to the Lion Club, he watched television. If Abdela drinks tea or watched television, he must be sick. But Abdela is not sick. Therefore, Abdela neither attended the graduation party nor went to the Lion Club.

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7. If you send me an e-mail message, then I will finish the program. If you don't send an e-mail message, then I will go to sleep early. If I am going to sleep early, then I will wake up feeling refreshed. Therefore either I will wake up early or I will finish the program.
8. It is not sunny this afternoon and it is colder than yesterday. We will go swimming only if it is sunny. If we do not go swimming, then we will take a boat trip. If we take a boat trip, then we will be at home by sun set. Therefore, we will be at home by sunset.
9. If I try hard and I have a talent, then I will become a musician. If I become a musician, then I will be very happy. Therefore, if I will not be happy, then I did not try hard or I do not have a talent.
10. If Barcelona reached the 2018 UEFA final in football, then Liverpool slipped up and Real Madrid played very well. Real Madrid is the winner of the 2018 UEFA Cup in football only if *Cristiano Ronaldo* is the best player of Europe. Real Madrid played very well implies that it is the winner of the 2018 UEFA Cup in football. Barcelona reached the 2018 UEFA final in football. Therefore if Real Madrid is not the winner and Barcelona reached the 2018 UEFA final football, then either Liverpool did not slip up or Real Madrid did not play very well.
11. Dr. Tedros played a major role in African Union's response to Ebola epidemic only if Ethiopia will continue to recruit its capable citizens to represent in the international level. Either Dr. Tedros didn't prioritized training and skill building of professionals or his victory to lead WHO is a remarkable diplomatic triumph for Ethiopia. Whenever Dr. Tedros doesn't play a major role in African Union's response to

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Ebola epidemic, he prioritizes training and skill building of professionals. Therefore if Dr. Tedros's victory to lead WHO is not a remarkable diplomatic triumph for Ethiopia, then Ethiopia will continue to recruit its capable citizens to represent in the international level.

- 12.** If the resulting scandal has been viral on social media, then the exam leaking was released via internet. The exam leaking released via internet only if the Ministry condemned the leaking of the exam or the internet has added some new dimension to the problem. The internet didn't add some new dimension to the problem and the resulting scandal has been viral on social media. Therefore, whenever the Ministry didn't condemn the leaking of the exam, all concerned organs should exert intensive effort to tackle the problem.

Remark: - *What is important in validity is the form of the argument rather than the meaning or content of the statements involved.*