NEPAL COLLEGE OF INFORMATION TECHNOLOGY
MFCS ASSIGNMENMENT_1.3

Level: Bachelor   Semester – Spring   Year: 2020
Programme: BEIT (2nd semester)   Time: 1 week
Course: Mathematical Foundation of Computer Science

Students are required to give their answers in their own words as far as practicable.

1. Verify all rules of inference using Truth Tables.

2. State which rule of inference is the basis of the following argument: *It is below freezing now. Therefore, it is either below freezing or raining now*.

3. State which rule of inference is the basis of the following argument: *It is below freezing and raining now. Therefore, it is below freezing now.*

4. State which rule of inference is used in the argument: *If it rains today, then we will not have a barbecue today. If we do not have a barbecue today, then we will have a barbecue tomorrow. Therefore, if it rains today, then we will have a barbecue tomorrow.*

5. State which rule of inference is used in the argument: *Fishing is a popular sport or lacrosse is wildly popular in California. Lacrosse is not wildly popular in California. Therefore, fishing is a popular sport.*

6. State which rule of inference is used in the argument: *Linda is an excellent swimmer. If Linda is an excellent swimmer, then she can work as a lifeguard. Therefore, Linda can work as a lifeguard.*

7. Show that the premises: "*If I play football then I am tired the next day*", "*I will take rest if I am tired*", "*I did not take rest*" will lead to the conclusion "*I did not play football*".

8. Show that the premises "*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 canoe trip.*" and "*If we take a canoe trip, then we will be home by sunset*" lead to the conclusion "*We will be home by sunset.*"

9. Show that the premises "*If you send me an e-mail message, then I will finish writing the program*", "*If you do not send me an e-mail message, then I will go to sleep early*" and "*If I go to sleep early, then I will wake up feeling refreshed*" lead to the conclusion "*If I do not finish writing the program, then I will wake up feeling refreshed.*"

10. Use rules of inference to show that the hypotheses "*If it does not rain or if it is not foggy, then the sailing race will be held and the lifesaving demonstration will go on*" and, *"If the sailing race is held, then the trophy will be awarded*" and "*The trophy was not awarded*" imply the conclusion "*It rained.*"

11. Use rules of inference to show that the hypotheses "*Randy works hard*", "*If Randy works hard, then he is a dull boy*", and "*If Randy is a dull boy, then he will not get the job*" imply the conclusion "*Randy will not get the job.*"

12. Use propositional logic to prove that below is a valid argument.

If my client is guilty, then the knife was in the drawer. Either the knife was not in the drawer or Jason Pritchard saw the knife. If the knife was not there on October 10, it follows that Jason Pritchard didn't see the knife. Furthermore, if the knife was there on October 10, then the knife was in the drawer and also the hammer was in the barn. But we all know that the hammer was not in the barn. Therefore, ladies and gentlemen of the jury, my client is innocent.