**Assignment 1**

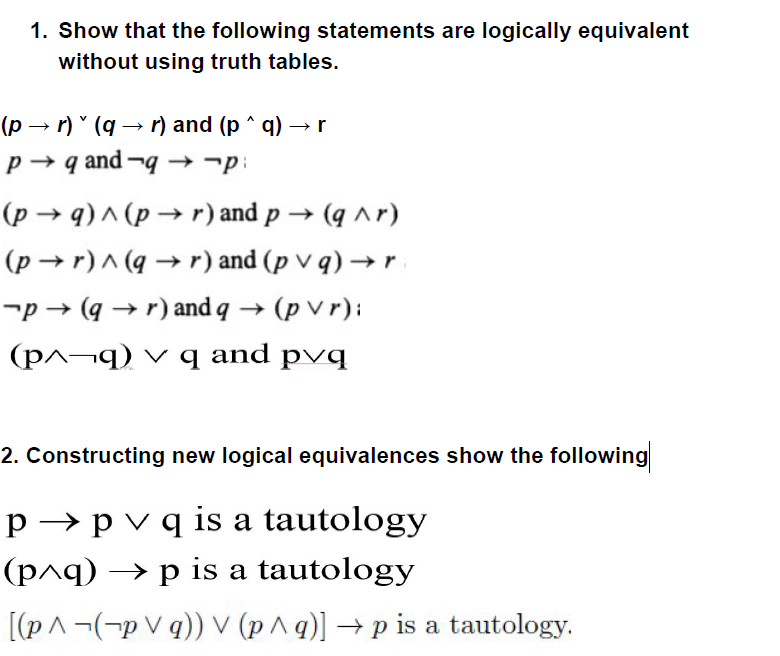
**Total Marks 80**

**Deadline: February**

**Logic Puzzles [7\*5=35 Marks]**

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| 1. | Isaac and Albert were excitedly describing the result of the Third Annual International Science Fair Extravaganza in Sweden. There were three contestants, Louis, Rene, and Johannes. Isaac reported that Louis won the fair, while Rene came in second. Albert, on the other hand, reported that Johannes won the fair, while Louis came in second.  In fact, neither Isaac nor Albert had given a correct report of the results of the science fair. Each of them had given one correct statement and one false statement. What was the actual placing of the three contestants? |
| 2. | At a family reunion were the following people: one grandfather, one grandmother, two fathers, two mothers, four children, three grandchildren, one brother, two sisters, two sons, two daughters, one father-in-law, one mother-in-law, and one daughter-in-law. But not as many people attended as it sounds. How many were there, and who were they? |
| 3. | Four friends have been identified as suspects for an authorized access into a computer system. They have made statements to the investigating authorities. Alice said "Carlos did it." John said "I did not do it." Carlos said "Diana did it." Diana said "Carlos lied when he said I did it."  If the authorities know that exactly one of the four suspects is telling the truth, who did it? Explain your reasoning. |
| 4. | Suppose you are visiting an island with knights, who always tell the truth, and knaves, who always lie.  Which statement is impossible for an islander to make?   1. **I am either a knight or a knave.** 2. **I am a knight.** 3. **I am a knave.** |
| 5. | Stella has several essays to write this weekend. Her father asked how many essays she needed to write, and she made two statements:  Statement 1: I have at least 3 essays to write.  Statement 2: I have at most 3 essays to write.  If her father knows that Stella never lies to him, can he determine exactly how many essays Stella needs to write on this weekend? |
| 6. | There are two men. One of them is wearing a red shirt, and the other is wearing a blue shirt. The two men are named Andrew and Bob, but we do not know which is Andrew and which is Bob.  The guy in the blue shirt says, “I am Andrew.”  The guy in the red shirt says, “I am Bob.”  If we know that at least one of them lied, then what color shirt is Andrew wearing? |
| 7. | John tells the truth on Mondays, Thursdays, and Saturdays, but lies on all the other days of the week.  One day he said, “I will tell the truth tomorrow.”  On which day of the week did he make this statement? |

**Logical Equivalences [9\*5=45 Marks]**

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