Math 107

Test 1

Part I

Use truth tables to determine if the following is a tautology or not. If not, provide a counterexample.

$$(\neg(A \bigvee B)) \Leftrightarrow ((A \Rightarrow C) \bigwedge (B \Rightarrow \neg C))$$

Part II

1.)Translate the following arguments into symbolic logic.
2.)Use a truth table to determine if the conclusion follows from the premeses.
3.)If it follows, provide a deduction of the conclusion from the premeses. If not, provide a counterexample.(You can use the back for scratch paper.)

1.) Premeses:
If you don't look good, then we don't look good.
If profits are up, then we look good.
Profits are up.

Conclusion: You look good.

Part III

In the following experiment proposal, identify:
1.) the population and the population size
2.) the sample and the sample size
3.)possible confounding variables and other sources of bias
Then describe a Randomized Comparitive Experiment getting reliable data. Use the table of random digits to choose the first three subjects for the experimental group.

Experiment proposal: We want to find out what percentage of the 10,000 Notre Dame undergraduates wear makeup on a regular basis. Picking a dorm formal at random, we watch the people coming in and mark how many are wearing makeup and how many are not. About 200 people come to the formal.

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Part IV

1.) Arrange the following sets of data into two stemplot diagrams back to back, as on the homework exercise.
2.) After making the stemplot diagrams,rotate them to make two histograms.
3.) Describe the shape of the histograms (skewed left? right? are there outliers?)
4.) Calculate the mean and median of each set of data.

Say we repeat the experiement performed in class on the effectiveness of using notes and the book on a quiz. Say we perform this experiment in a class with 40 students. We break the students up into 20 in the experimental group (who can use their notes and book) and 20 in the control group (who cannot use their notes and book.) We get the following sets of data:

Experimental group:

54	36	62	50	56
42	65	60	54	69
95	60	65	45	68
63	47	55	69	56

Control group:

52	40	39	31	49
38	45	31	65	30
59	86	36	46	56
37	36	33	45	44

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