

## CS 202 Final Exam Grading Guidelines

### Question 1

If they mix up the converse and inverse, give them only 2 points. Otherwise, deduct 2 points for not getting one of the two, and all 5 points if they miss both.

### Question 2

3 points for labeling the steps, 12 points for the steps of the proof. Partial credit based on how well they did the chain; 3 points for each error in the chain.

### Question 3

If they give a statement where the consequence is always true, then give full credit. If they give a vacuous proof instead (i.e. the answer for question 4), give them 3 points. Not sure about partial credit here...

### Question 4

If they give a statement where the consequence is always true, then give full credit. If they give a trivial proof instead (i.e. the answer for question 3), give them 3 points. Not sure about partial credit here...

### Question 5

5 points is for setting up the proof by contradiction correctly (phrasing it as a conditional, and then assuming it's false), and the other 5 points for the completion of the proof. If they said "if  $3n+2$  is even **then**  $n$  is odd", -3 points. 2 points if they didn't do proof by contradiction, but still showed it was true. 2 points off if they didn't do a formal proof.

### Question 6

3 points for labeling the steps, 12 points for the steps of the proof. Partial credit based on how well they did the chain. 1 point off for an incorrect labeling. 3 points off if one of the rules was applied wrong.

### Question 7

3 points for labeling the steps (1 point for each of the steps). 2 points for the base case, 2 for the inductive hypothesis, and the remaining 8 points for the inductive step. 1 off if a value other than 0 for the base case. Partial credit for inductive step based on how good the solution was.

### Question 8

A few answers got 2 of 5 points:  $2n$ ,  $C(n,2)$ , and  $n^2$ . All else got zero points.

### Question 9

The  $2^7$  term is worth 2 points, the  $C(13,7)$  is worth the other 3 points.

### Question 10

Partial credit based on how close their answer was.

Question 11

2 points for the number of possible poker hands. 8 for the number of straights (5 of this 8 was for getting the  $C(10,1)$ , 3 of the 8 was for the  $4^4$ ). 5 for phrasing it as a probability. Note that they can still get full credit if they excluded straight flushes or royal flushes (the didn't have to).

Question 12

5 points off for not using the pigeonhole principle. Rest of the partial credit based on how good the solution was.

Question 13

2 points off for incorrect calculation. Rest of the partial credit based on how good the solution was.

Question 14

All or nothing here – no partial credit.

Question 15

3 points if they got one of the two correct.

Question 16

3 points if they got one of the two correct.

Question 17

All or nothing here – no partial credit.

Question 18

2 points if you defined one correctly; full credit if you defined both correctly.

Question 19

3 points if they got one of the two correct. If they missed one property of the 6, then 1 point off.

Question 20

7 points if they got two correct, 4 points if they got only one correct. Maximum of 4 points if they didn't explain. For each part, 1 point for labeling, 2 for defining. Which adds up to 9 points, so 1 free point given here.

Question 21

3 points for labeling the steps, 12 points for the steps of the proof. Partial credit based on how well they did the chain.

Question 22

Note that any application will be considered a correct answer, as long as it's specific (i.e., 'computer' would not count, as that doesn't show how you are applying the particular concept). Was very lenient with the induction application. Each one worth 2 points, and the induction was worth 1 point.