There will be 5 questions each worth 20 points.

1. Solving an LP using the graphical method.

   I will give you an LP in 2 variables and 3 or 4 constraints. The constraints may be "<="; "=>" or "=" constraints.

   You will be required to:
   - Draw the constraints.
   - Identify the Feasible Region and the Corner Points
   - Draw a line representing the Objective Function at some value for the Objective Function Value.
   - Indicate how the line drawn above leads you to the Optimal Solution.
   - State the Optimal Solution. e.g. (x1 = 7, x2 = 9 s1 = ….s4 = … z= 45)
   - Identify the Binding and Non-Binding Constraints.

2. Formulating an LP from a "word problem".

   I will give you a "word problem" along the lines of the Fudge and Choc Bars problem in the Homework.

   You will be required to:
   - Formulate the Objective Function; using the appropriate accounting concepts such as Contribution to Profit.
   - Formulate the constraints.
   - Formulate the bounds.
   - Make sure that you present the problem in proper form. e.g.

```
Max    2   x1 + 3   x2
Subject to
        1.5 x1 + 2.3 x2 <= 12        (1) Dragons
        4.2 x1 + 5.2 x2 => 10        (2) Elves
            x1          <= 230       (3) Dungeons
            x1,        x2 => 0
```

   That is to say that "Subject to" or "s.t." are part of the formulation, and that the Objective Function goes first, followed by the Constraints and then the Bounds.

3. A simplex pivot from the "tableau before the final tableau" to the "final tableau".

   I will give you a tableau, which needs only 1 pivot to reach an optimal solution, and the original problem.

   You will be required to:
   - Identify the Entering Variable and State the Rule you used.
   - Apply the Ratio Test to Identify the Leaving Variable and State the Rule you used.
   - Pivot once to the optimal solution
   - Update the Basis and the Costs for the Basic Variables
   - Update the Zj values
   - Update the (Cj –Zj) Values
   - State the rule you applied to know that the solution was the optimal solution.
   - State the Optimal Solution. e.g. (x1 = 7, x2 = 9 s1 = ….s4 = … z= 45)

4. Special cases in either or both of the graphical form or the simplex method.

   I will give you something like 3 Tableau and 2 graphs.

   You will be required to:
   - Identify the special case each one represents and indicate what action would be appropriate, if any, in each case.

5. Answer interpretation and Sensitivity analysis from Excel solutions worksheets.

   I will give you an LP, the Excel Answer sheet and the Excel Sensitivity Sheet from the optimal solution.

   You will be required to:
   - State the Optimal Solution. e.g. (x1 = 7, x2 = 9 s1 = ….s4 = … z= 45), by reading the Excel Answer sheet.
   - Answer up to 4 questions using the Excel Sensitivity Sheet e.g. By how much can the Right Hand Side of the 2nd constraint be reduced before the optimal solution would change.

It is conceivable, but undecided as yet, that I would include a 10-point bonus question.