DEPARTMENT OF ECONOMICS
SAN JOSE STATE UNIVERSITY
MASTER'S COMPREHENSIVE EXAMINATION

MAY 6, 2005
6:30 P.M. TO 9:30 P.M.
PROCTOR: J. HUMMEL

**INSTRUCTIONS:**

1. Answer ONLY the specified number of questions from the options provided in each section. Do not answer more than the required number of questions.
2. Your answers must be on the paper provided. No more than one answer per page. Do not answer two questions on the same sheet of paper.
3. If you use more than one sheet of paper for a question, write "Page 1 of 2" and "Page 2 of 2."
4. Write ONLY on one side of each sheet using only pen. Answers written in pencil will be disqualified.
5. Write **------ END -----** at the end of each answer.
6. Write your 4-digit identification number in the upper right-hand corner of each sheet of paper.
7. Write the question number in the upper right hand corner of each sheet of paper.

**Section 1: Microeconomic Theory—Answer Any Two Questions.**

**1A.** Assume $U = U(x, y) = xy + y$ and $P_x x + P_y y = M$.
(a) Solve for the demand schedules of x and y.
(b) Describe the impact of price, the other price, and income on each demand schedule.

**1B.** Assume a production function of $Q = 1000K^{0.5}L^{1.25}$.
(a) Determine the marginal productivity of K and L.
(b) Derive the MRTS.
(c) Determine the returns to scale.

**1C.** Rita's indifference curves are smooth and convex. Given that $P_1$ = \$2 and $P_2$ = \$4, Rita buys consumption bundle $(x_1, x_2) = (100, 50)$. Assume that Rita always makes a rational choice. (A) Write down Rita's budget constraint and then use the indifference curves and budget constraint to show Rita's choice. (B) If $P_1$ increases to \$3 and Rita's income increases by \$100, please show Rita's new budget line and new choice, i.e., the new consumption bundle. From your answers to (A) and (B), can you tell whether she will be better off or worse off? Please explain verbally and graphically.

**1D.** An optimization problem with constraint—work -leisure choice to maximize utility (must use the Lagrange method). Suppose an individual has utility function $U = 10MR^2$. Her time constraint is T = 24 hours per day. She can spend her time working, earning money income M at a wage rate of w = \$5/hour. Any time not spending working is Leisure (R). Use the Lagrange method to find the utility-maximizing combination of working hours and leisure hours. Also, calculate the marginal utility of time (T).