ECON 3113 Microeconomics Theory I 2020
Midterm Test
Total time allowed: 1 hour and 20 minutes
Total points: 110

Part 2 (50 Points)

Throughout the test, unless otherwise specified, let the commodity space be $\mathbb{R}^2_+$. That is, there are two goods for consumptions and a typical consumption bundle takes the form (x_1, x_2), where x_1 is the quantity of consumption of good 1 and x_2 is the quantity of consumption of good 2. These quantities can be any positive real numbers.

3. Suppose a consumer has the following preference: he strictly prefers bundle (x_1, x_2) to (y_1, y_2) if $x_1 > x_2$, and he finds the two bundles indifferent if $x_1 = x_2$.

   (a) Which of following properties does this preference satisfy? Explain your answer. (If you answer that the preference satisfies a property, prove it. If you answer that the preference does not satisfy a property, give a counter-example.)

   (i) Strict monotonicity

   (5 points)

   (ii) Convexity

   (5 points)

   (iii) Continuity

   (5 points)

   (b) Let the price of good 1 be \$50 and price of good 2 be \$30. If the consumer has an income of \$100, what is his optimal consumption bundle?

   (5 points)

   (Total: 20 points)

4. Drake is a farmer who grows rice (good 1) and onions (good 2). The output of his farm is stable at 30 sacks of rice and 20 sacks of onions each year. Drake does not have other sources of income. Assume in this world, the size of a sack is standardized.

   His yearly utility function for rice and onion is $U(x_1, x_2) = x_1 + 2x_1x_2$, where the goods are again measured in the unit of sacks.

   (a) Let the market price of one sack of rice be \$10 and that of one sack of onion be \$40. What is the optimal consumption bundle of Drake? Is Drake a seller or buyer of rice? (Hint: you may assume without proof that the solution of utility maximization is interior.)

(15 points)

(b) Suppose the price of onions goes up. Would Drake benefit or suffer from the price hike? Explain.

(15 points)

(Total: 30 points)