

系所組別： 交通管理科學系甲、乙組

考試科目： 經濟學

考試日期： 0220 · 節次： 1

※ 考生請注意：本試題 可 不可 使用計算機 請勿在本試題紙上作答，否則不予計分

Question 4. A third brother, Rex Carr, owns a junk yard. Rex can use one of two methods to destroy cars. The first involves purchasing a hydraulic car smasher that costs \$200 a year to own and then spending \$1 for every car smashed into oblivion; the second method involves purchasing a shovel that will last one year and costs \$10 and paying the last Carr brother, Scoop, to bury the cars at a cost of \$5 each.

(a) Write down the total cost functions for the two methods, where y is output per year: _____

(b) If Rex wrecks 40 cars per year, which method should he use?

_____. If Rex wrecks 50 cars per year, which method should he use? _____. What is the smallest number of cars per year for which it would pay him to buy the hydraulic smasher?

Question 5. Think of a worker Lisa with an annual income of \$12,000. Suppose that she receives wage payments once a month. Consumption spending is constant at \$12,000 per year. Assume that Lisa holds no bonds; that is, she holds all financial assets in the form of money.

(a) What is Lisa's average money balance? _____

(b) What would the average money balance be if Lisa was paid twice a month instead of once a month? _____

Assume again that Lisa is paid once a month. But instead of carrying out consumption expenditures in a uniform flow, Lisa now makes periodic shopping trips. At each trip she buys enough goods (for example, groceries) to last until the next trip.

(c) If Lisa shops four times each month, then what is the average money balance? _____

(d) What is the average inventory of goods if Lisa shops only twice each month? _____

Question 6. Suppose that the U.S. Treasury receives \$1 billion of gold from abroad. Then the Treasury deposits the gold at the Federal Reserve (the Fed), so that the Fed's gold account and the Treasury's deposits at the Fed rise by \$1 billion.

(a) What happens to the monetary base if the Treasury holds the extra \$1 billion in deposits? _____

(b) How can the Fed offset the effect of the gold inflow on the monetary base? (If it takes this action, the Fed is said to "sterilize" the inflow of gold.)

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There are 20 questions in blank and each question is 5 points. 100 points in total.

Question 1. Dudley's utility function is $U(C, R) = C - (12 - R)^2$, where R is the amount of leisure he has per day. He has 16 hours a day to divide between work and leisure. He has an income of \$20 a day from nonlabor sources. The price of consumption goods is \$1 per unit.

- (a) If Dudley can work as many hours a day as he likes but gets zero wages for his labor, how many hours of leisure will he choose? $R =$ _____
- (b) If Dudley can work as many hours a day as he wishes for a wage rate of \$10 an hour, how many hours of leisure will he choose? $R =$ _____
- (c) If Dudley's nonlabor income decreased to \$5 a day, while his wage rate remained at \$10, how many hours would he choose to work? $W =$ _____
- (d) Suppose that Dudley has to pay an income tax of 20 percent on all of his income, and suppose that his before-tax wage remained at \$10 an hour and his before-tax nonlabor income was \$20 per day. How many hours would he choose to work? $W =$ _____

Question 2. Billy John Pigskin of Mule Shoe, Texas, has a von Neumann-Morgenstern utility function of the form $u(c) = \sqrt{c}$. Billy John also weighs about 300 pounds and can outrun jackrabbits and pizza delivery trucks. Billy John is beginning his senior year of college football. If he is not seriously injured, he will receive a \$1,000,000 contract for playing professional football. If an injury ends his football career, he will receive a \$10,000 contract as a refuse removal facilitator in his home town. There is a 10% chance that Billy John will be injured badly enough to end his career.

- (a) What is Billy John's expected utility? $u =$ _____
- (b) If Billy John pays \$ p for an insurance policy that would give him \$1,000,000 if he suffered a career-ending injury while in college, then he would be sure to have an income of $\$1,000,000 - p$ no matter what happened to him. Write an equation that can be solved to find the largest price that Billy John would be willing to pay for such an insurance policy. _____
- (c) Solve this equation for $p =$ _____.

Question 3. Farmer Hoglund has discovered that on his farm, he can get 30 bushels of corn per acre if he applies no fertilizer. When he applies N pounds of fertilizer to an acre of land, the *marginal product* of fertilizer is $1 - N/200$ bushels of corn per pound of fertilizer.

- (a) If the price of corn is \$3 a bushel and the price of fertilizer is \$ p per pound (where $p < 3$), how many pounds of fertilizer should he use per acre in order to maximize profits? $N =$ _____
- (b) Write down a function that states Farmer Hoglund's yield per acre as a function of the amount of fertilizer he uses. _____

(背面仍有題目,請繼續作答)