

系所組別：電信管理研究所甲組

考試科目：經濟學

考試日期：0223，節次：2

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

Entrance Examination for Institute of Telecommunications Management in 2014

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

Question 1. Ms. Sarah Traveler does not own a car and travels only by bus, train, or plane. Her utility function is given by $utility = B \cdot T \cdot P$, where each letter stands for miles traveled by a specific mode. Suppose that the ratio of the price of train travel to that of bus travel (P_T/P_B) never changes.

- (a) How might one define a composite commodity for ground transportation (G)? $G =$ _____
- (b) Phrase Sarah's optimization problem as one of choosing between ground (G) and air (P) transportation
_____.
- (c) What is Sarah's demand function for G ? $G =$ _____
- (d) Once Sarah decides how much to spend on G , how will she allocate those spending on B ? $P_B B =$ _____

Question 2. Consider the following highway pricing problem. The demands for peak hours and off-peak hours in a day are $x_1 = 9,600,000 - 12,000p_1$ and $x_2 = 2,400,000 - 6,000p_2$, with the operating costs of $c_1(x_1) = 40x_1$ and $c_2(x_2) = 20x_2$, respectively. The capacity of the highway is $k = 750,000$ with the capacity cost of $r(k) = 30k$, and the number of peak hours is $t_1 = 12$. Find the profit-maximizing price $p_1 =$ _____, $p_2 =$ _____, and total flow _____, and profit $\pi =$ _____ in a day.

Question 3. Suppose the total cost function for a firm is given by

$$TC = (0.5r + r^{0.5}w^{0.5} + 0.5w)q.$$

where r is the price of capital K , w is the price of labor L , and q is the level of output.

- (a) Use Shepard's lemma to compute the constant output demand functions for inputs $L =$ _____ and $K =$ _____.
- (b) Use the results from part (a) to compute underlying production function for q _____.

Question 4. Suppose a monopoly can produce any level of output it wishes at a constant marginal (and average) cost of \$5 per unit. Assume the monopoly sells its goods in two different markets separated by some distance. The demand curve in the first market is given by $Q_1 = 55 - P_1$, and the demand curve in the second market is given by $Q_2 = 70 - 2P_2$.

- (a) If the monopoly can maintain the separation between the two markets, what prices will prevail in each market? $P_1 =$ _____, $P_2 =$ _____ What are total profits in this situation? $\pi =$ _____
- (b) How would your answer in part (a) change if the firm is forced to follow a single-price policy?
 $P =$ _____, $\pi =$ _____

(背面仍有題目，請繼續作答)

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Question 5. Consider the Keynesian model within the open-economy version. Suppose that consumption function is $C=a+cY_D$, disposable income is $Y_D=Y-T$, investment is I , government expenditure is G , export is X , import is $M=b+mY_D$.

(a) Compute the expression for equilibrium income for this version of the open-economy model.

$Y=$ _____ Compute an expression for the tax multiplier in the model. _____

(b) Suppose there is an autonomous increase in imports of 20 units (i.e., b rises by 20). To counteract the effects of this contraction in domestic aggregate demand, assume the government cuts taxes by 20 units. Will equilibrium income rise, be unchanged or fall? _____ By how much? _____