

國立成功大學
111學年度碩士班招生考試試題

編 號：340

系 所：經濟學系

科 目：總體經濟學

日 期：0219

節 次：第 3 節

備 註：不可使用計算機

※ 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。

1. (35%) Consider a Solow model with Cobb-Douglas production function

$$Y = AK^\alpha L^{1-\alpha}$$

where Y , A , K and L represent output, TFP, capital and labor respectively. Let s be the saving rate, δ be the depreciation rate and n be the population growth rate.

- a) (10%) Is sustained growth in GDP per capita possible under this technology? Explain your answer.

Now, suppose that TFP increases exogenously and let g be this growth rate.

- b) (10%) Transform your model such that your model has a steady state.
 c) (10%) Write down the evolution of capital (according to your transformation in part (b)).
 d) (5%) Derive the steady state of part (c).

2. (30%) Consider a representative agent with utility given by

$$\sum_{t=0}^{\infty} \beta^t \frac{C_t^{1-\sigma}}{1-\sigma}$$

subject to the budget constraints

$$C_t + K_t + M_t + B_t = Y_t + (1+r_t)K_{t-1} + M_{t-1} + (1+r_t^b)B_{t-1}$$

where C_t , K_t , M_t , B_t and Y_t represent consumption, capital, money holdings, bond holdings and output at time t respectively. Production function is given by the following Cobb-Douglas form $Y = AK^\alpha$ and money supply and bond supply are fixed at \bar{M} , \bar{B} respectively.

- a) (10%) Derive the first-order conditions for the agent.
 b) (10%) Derive the equilibrium interest rate r_t .
 c) (5%) What is r_t^b to clear the bond market?
 d) (5%) Can the money market clear? Why or why not?

3. (20%) Suppose an unemployed worker will receive a job offer every period. The job offer is represented by a wage w which is drawn from a fixed distribution $F(w)$. Assume that F has support $[0, B]$. After the worker received the job offer, he can choose whether to accept it or reject it. There are no unemployment benefits in this society. Also, with probability δ , the worker is fired and becomes unemployed. Workers consume all their earnings every period without saving and maximized lifetime utility which is given by

$$\sum_{t=0}^{\infty} \beta^t C_t$$

- a) (10%) Derive an equation (or equations) which characterized the optimal solution of the unemployed worker.
 b) (10%) Conjecture what happens to your answer in part (a) if the government decide to offer unemployment benefits.

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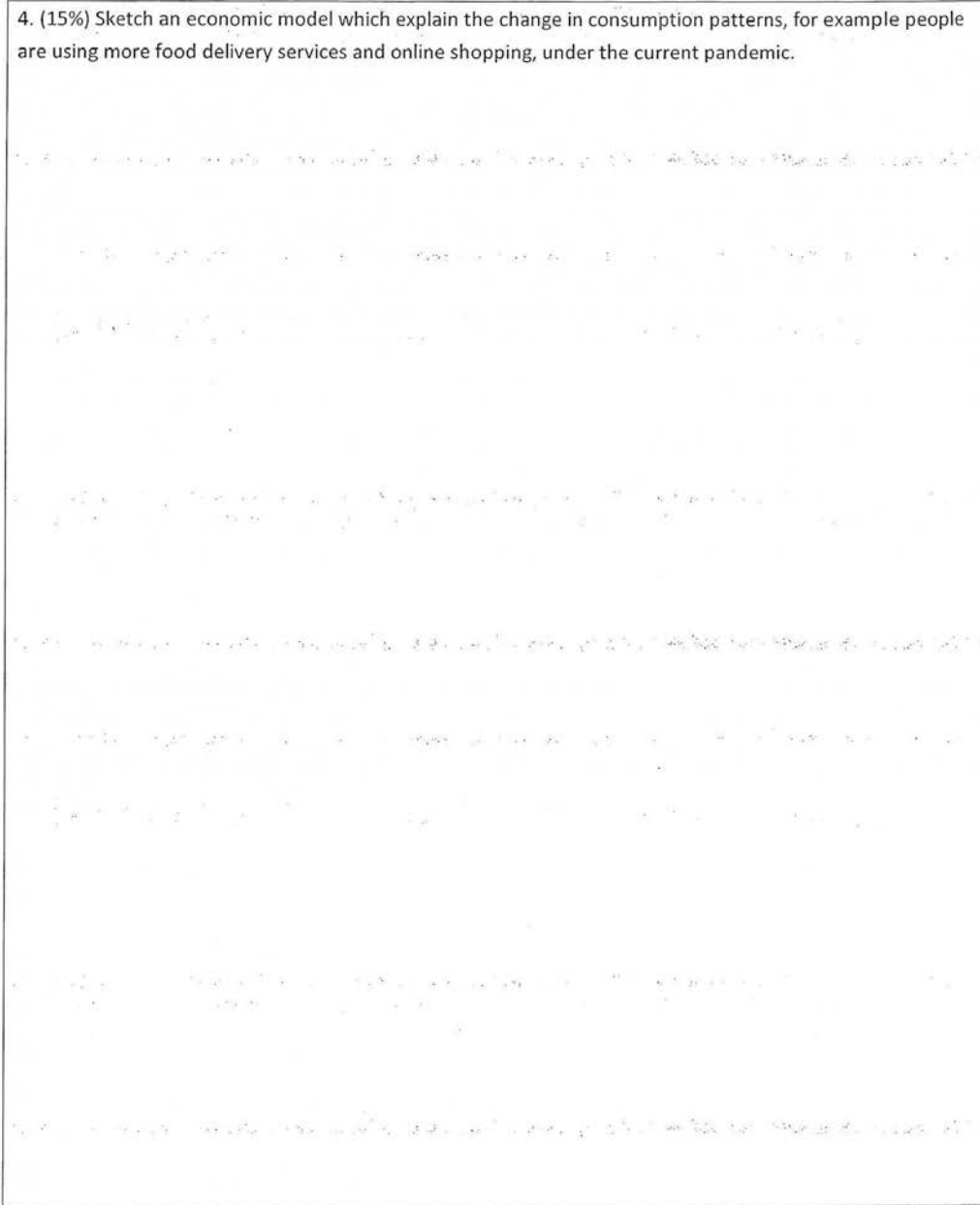
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4. (15%) Sketch an economic model which explain the change in consumption patterns, for example people are using more food delivery services and online shopping, under the current pandemic.

A large empty rectangular box with a thin black border, intended for the student to sketch an economic model. The box is currently blank.