

# 经济学院本科生 2020-2021 学年第二学期 《高级宏观经济学》期末考试（开卷）

2021 年 6 月 27 日

姓名： \_\_\_\_\_

学号： \_\_\_\_\_

1. ( $10' + 10' + 10' + 20' = 50$  points) Answer the following questions based on your interpretation of the Romer model in Chapter 3.

- (a) Does the technological progress take place in the form of increased variety of intermediate goods or increased quality of final goods?
- (b) It is said that once an additional unit of knowledge is created by a firm, it becomes a monopolist. Does it monopolize the knowledge just created, so that everybody else cannot utilize the new knowledge? Explain your answers.
- (c) How could a monopolist makes zero profit in this model?
- (d) It is said that the endogenous economic growth in this model is rooted in some “externalities” features (外部性). Explain explicitly what these “externalities” are.

2. ( $10' + 20' + 20' = 50$  points) Recall equation (5.26) in your textbook:

$$\frac{c_t}{1 - \ell_t} = \frac{w_t}{b} \quad (5.26)$$

- (a) Is the equation above a *necessary* condition or a *sufficient* condition for a representative household to solve its optimization problem?

(b) The equation above is derived from the instantaneous utility function

$$u(c_t, 1 - \ell_t) = \ln c_t + b \ln(1 - \ell_t).$$

Now suppose the instantaneous utility function becomes

$$u(c_t, 1 - \ell_t) = \frac{[c_t^\rho (1 - \ell_t)^{1-\rho}]^{1-\gamma} - 1}{1 - \gamma}, \quad (1)$$

where  $\rho \in (0, 1)$ ,  $\gamma > 0$ . How should equation (5.26) be revised accordingly?

(c) Suppose the representative household's preference is depicted by equation (1) above. You know that, along the economy's balanced growth path, a representative household works 8 hours per day, and its consumption is equal to its labor income. Based on your answer to question (b), calibrate the value of  $\rho$ .