

ROLL NO:

DATE: 17/11/2025

READ THESE INSTRUCTIONS CAREFULLY.

- You have **180 minutes** to complete this exam. Attempt all questions. The exam is out of **100**.

1. South Korea has the following domestic supply and demand for baseball hats:

$$P_d = 20 - 2Q_d, P_s = 5 + Q_s$$

The world price for baseball hats is 7 dollars.

[25 marks]

- a. (3 Marks) Initially, what is the number of baseball hats that South Korea imports/exports? How many baseball hats are made by domestic Korean companies?
 - b. (4 Marks) What is the consumer surplus? The domestic producer surplus?
 - c. (6 Marks) The government wants to protect domestic production of baseball hats and decides to impose a \$1 tariff on foreign baseball hat makers. How does this change the consumer and producer surplus? How much revenue does the government raise?
 - d. (2 Marks) As with most government policies, there are winners and losers from the adoption of tariffs. Using the information from your answer to (c), who favors tariffs: domestic consumers or domestic producers of baseball hats?
 - e. (8 Marks) The tariff idea gets shot down by the legislature. So, the government decides to implement a quota restricting the quantity of hats that may be imported to 2: what is (i) the quantity of baseball hats produced domestically, (ii) domestic consumer and producer surpluses, and (iii) how much is the quota rent?
 - f. (2 Marks) What is the main difference between these two policies?
2. The market for study desks is characterized by perfect competition. Firms and consumers are price takers and in the long run there is free entry and exit of firms in this industry. All firms are identical in terms of their technological capabilities. Thus, the cost function as given below for a representative firm can be assumed to be the cost function faced by each firm in the industry. The total cost and marginal cost functions for the representative firm are given by the following equations: [30 marks]

$$TC = 2q_s^2 + 5q_s + 50$$

$$MC = 4q_s + 5$$

Suppose that the market demand is given by:

$$P_D = 1025 - 2Q_D$$

Note: Q represents market values and q represents firm values. The two are different.

- a. (2 Marks) Determine the equation for average total cost for the firm.
- b. (4 Marks) What is the long-run equilibrium price in this market?
- c. (2 Marks) What is the long-run output of each representative firm in this industry?
- d. (4 Marks) When this industry is in long-run equilibrium, how many firms are in the industry?
- e. (2 Marks) In the short-run will a representative firm in this industry earn negative economic profits, positive economic profits, or zero economic profits?
- f. (2 Marks) In the long-run will a representative firm in this industry earn negative economic profits, positive economic profits, or zero economic profits?
- g. (6 Marks) Now, consider another scenario where technology advancement changes the cost functions of each representative firm. The market demand is still the original one. The new cost functions are:

$$TC = q_s^2 + 5q_s + 36$$

$$MC = 2q_s + 5$$

What will be the new equilibrium price? Is it higher or lower than the original equilibrium price?

- h. (4 Marks) In the long-run given this technological advance, how many firms will there be in the industry?
 - i. (2 Marks) What will be the new long-run equilibrium price in this industry?
 - j. (2 Marks) At the new long-run equilibrium, what will be the output of each representative firm in the industry?
3. Assume the adult population of a country X is 250 million. The number of employed workers in the country is 190 million, and the number of unemployed workers is 10 million.

[25 marks]

- (a) (4 marks) What is the unemployment rate and the labor force participation rate?
- (b) (5 marks) The job finding rate is 0.09 and the rate of job separation is 0.01. What is the natural rate of unemployment in the country X? Is the current unemployment rate higher or lower than the natural rate? If it is different then why, explain?
- (c) (6 marks) Now suppose that the government of X is concerned that the natural rate of unemployment is too high. Name three policies that would help lower the natural rate of unemployment. Discuss.
- (d) (4 marks) Calculate the rate of job finding that is consistent with a 4% natural rate of unemployment?
- (e) (6 marks) Assume that the government is considering to abolish the minimum wage. What effect will this strategy have on f , s , and the natural rate of unemployment? Please explain.

4. Betty spends all her income on statistical software (s) and clothes (C). Her preferences can be represented by the utility function: $U(S,C) = 4 \ln(S) + 6 \ln(C)$.

[20 marks]

- (a) (2 marks) Compute the marginal rate of substitution of software for clothes.
- (b) (5 marks) Find Betty's demand functions for software and clothes in terms of the price of software (p_s), the price of clothes (p_c), and Betty's income (I).
- (c) (3 marks) Suppose that the price of software is $p_s = 2$, the price of clothes is $p_c = 3$, and Betty's income is $I = 10$. What bundle of software and clothes (S, C) maximizes Betty's utility?
- (d) (2 marks) Suppose the price of software increases to $p_s = 4$. What bundle of software and clothes does Betty demand now?
- (e) (3 marks) Given the price increase, how much does Betty need to remain as happy (have the same utility) as she was before the price change? What bundle of software and clothes would Betty consume if she had that additional income, given the new prices?
- (f) (5 marks) Going back to the situation in part (e) ($p_s = 4$ and $I = 10$), decompose the total change of software and clothes demanded into substitution and income effects. In a clearly labelled diagram, with software on the horizontal axis, show the income and substitution effects of increase in the price of software.
