BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

DEPARTMENT OF ECONOMICS

BACHELOR OF SCIENCE HONOURS DEGREE IN ECONOMICS

ADVANCED ECONOMIC THEORY I (EC 401) JUN 2024

EXAMINATION **DURATION: 3 HOURS**

INSTRUCTIONS TO CANDIDATES

1. **Answer four (4) questions**
2. **The paper carries six questions**
3. **All questions carry equal marks of 25 each**
4. **The use of cellphones is not allowed in the exam**

Question 1

"There are certain fixed costs when you own a plane," former tennis star Andre Agassi explained, "so the more you fly it, the more economic sense it makes. . .. The first flight after I bought it, I took some friends to Palm Springs for lunch." (Ostler, Scott, "Andre Even Flies like a Champ," *San Francisco Chronicle*, February 8, 1993, C1.)

(a) Discuss whether Agassi's analysis is reasonable. **[10 marks]**

(b) A manufacturing plant has a short-run cost function of:

$$C(q) = 100q - 4q^2 + 0.2q^3 + 450.$$

(i) What is the firm's short-run fixed cost and variable cost function? **[6 marks]**

(ii) Derive the formulas for its marginal cost, average variable cost, average fixed cost, and average cost. **[6 marks]**

(iii) Draw two figures, one above the other. In the top figure, show the fixed cost, variable cost, and total cost curves. In the bottom figure, show the corresponding marginal cost curve and three average cost curves. **[3 marks]**

Question 2

(a) Examine the differences between dominant strategy and dominated strategy **(6 marks)**

(b) Giving examples (s), analyse the importance of chicken game to real life situations **(10 marks)**

(c) Analyse why a Cournot equilibrium with two firms, neither firm would have any regret about its output choice after it observes the output choice of its rival. **(9 marks)**

Question 3

Consider Julia who consumes two goods, X_1 and X_2, according to the following Cobb-Douglas utility function:

$$U(X_1, X_2) = X_1^{\alpha} X_2^{1-\alpha}$$

If the price of X_1 is P_1 and the price of X_2 is P_2 and Julia has a total income of M:

(a) Determine Julia's optimal consumption bundle in terms of her income and prices of the two goods. **[7 marks]**

(b) What share of her income does she spend on X_1. **[5 marks]**

(c) Derive her expenditure function. **[5 marks]**

(d) Derive the compensated demand functions of X_1 and X_2. **[8 marks]**

Question 4

An incumbent firm, Firm 1, faces a potential entrant, Firm 2 that has a lower marginal cost. The market demand curve is $p = 120 - q_1 - q_2$. Firm 1 has a constant marginal cost of \$20, while Firm 2's is \$10.

(a) What are the Nash-Cournot equilibrium price, quantities, and profits if there is no government intervention? **[10 marks]**

(b) To block entry, the incumbent appeals to the government to require that the entrant incur extra costs. What happens to the Nash-Cournot equilibrium if the legal requirement causes the marginal cost of the second firm to rise to that of the first firm by \$20? **[10 marks]**

(c) Now suppose that the barrier leaves the marginal cost alone but imposes a fixed cost. What is the minimal fixed cost that will prevent entry? **[5 marks]**

Question 5

To discourage people from breaking the traffic laws, society can increase the probability that someone exceeding the speed limit will be caught and punished, or it can increase the size of the fine for speeding.

(a) Explain why either method can be used to discourage speeding. **[5 marks]**

(b) Which approach is a government likely to prefer, and why? **[10 marks]**

(c) Suppose that most people will not speed if the expected fine is at least $500. The actual fine for speeding is $800. How high must the probability of being caught and convicted be to discourage speeding? **[10 marks]**

Question 6

Jill possesses $160,000 worth of valuables. She faces a 0.2 probability of a burglary, where she would lose jewellery worth $70,000. She can buy an insurance policy for $15,000 that would fully reimburse the $70,000. Her utility function is:

$U(X) = 4X^{0.5}$

(a) What is the actuarially fair price for the insurance policy? **[5 marks]**

(b) With the aid of calculus, advise Jill whether she should buy the actuarially fair insurance policy or not. **[10 marks]**

(c) What is the most that she is willing to pay for an insurance policy that fully covers it against loss? **[10 marks]**

END OF PAPER