Microeconomics II

June 1, 2026
Duration: 60m+40m

Resit Exam

Full name: .....

Student number: ..... Class: .....

1. This exam consists of two parts. Part A consists of 16 multiple-choice questions and is worth 10 points. Part B consists of 2 open questions and is also worth 10 points.
2. Part A must be completed in 60 minutes and Part B in the remaining 40 minutes.
3. Indicate your answers to part A with an "X" in the table below. Each correct answer is worth 10/16 (= 0.625) points and each wrong answer is penalized by (10/16) /3 ($\approx$ 0.210) points.
4. Any kind of consultation is not allowed.
5. Turn off mobile phones, computers, tablets, and smartwatches. Their use will be considered fraud. The use of a non-graphical calculator is allowed.
6. Write your full name and student number on every answer sheet.
7. Return this answer sheet even if you withdraw from the exam.

ANSWER TABLE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
b	b	b	b	b	b	b	b	b	b	b	b	b	b	b	b
c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c
d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d

English – Version A

PART A
MULTIPLE CHOICE (10 points / 60 min)

1. In the Coase theorem, in the absence of transaction costs and with well-defined property rights, it is correct to state that:

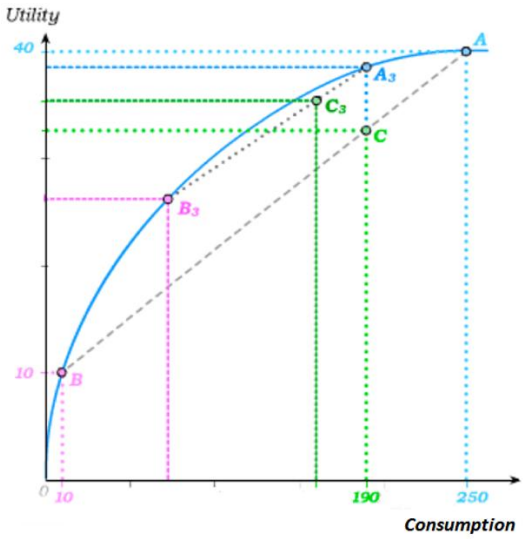
a. The efficient outcome always depends on who initially receives the rights, because this determines the marginal external cost.
b. The efficient outcome is achieved regardless of the initial allocation of rights, although the distribution of surplus may differ.
c. The efficient outcome is achieved only if the rights are assigned to the agent generating the externality.
d. The efficient outcome requires public intervention to prevent opportunistic behaviour, even in the absence of transaction costs.

2. Employee training generates benefits not only for the firm providing the training but also for other firms, since workers may switch jobs and transfer skills. Economists conclude that the market produces too _____ employee training from a societal perspective because firms do not consider the _____ benefit. To correct this inefficiency, the government may introduce a _____ equal to the _____ external benefit at the socially efficient level of training. Which option correctly completes the sentence?

a. much; private; tax; marginal
b. little; private; subsidy; total
c. much; external; tax; total
d. little; external; subsidy; marginal

3. Suppose a person faces uncertainty between having a disease, in which case consumption is 10 monetary units, and being healthy, in which case consumption is 250 monetary units (see the figure on the next page). If this person is risk averse, they may purchase an actuarially unfair insurance contract such as the one characterised by C_3 in the figure because:

a. It maximises expected income, and insurance always increases expected value.
b. They prefer to reduce risk: they are willing to pay a premium above the actuarially fair value in exchange for replacing a large uncertain loss with a smaller certain loss.
c. They purchase insurance only if the premium is below the actuarially fair value; otherwise, doing so is irrational.
d. Risk aversion always implies that the certainty equivalent is greater than the expected value.



4. An insurance company wants to offer two car insurance contracts to separate low-risk and high-risk drivers. For this screening mechanism to work, it is necessary that:

a. The low-risk contract is sufficiently generous (i.e., high coverage) to also attract high-risk individuals, thereby reducing administrative costs.
b. The high-risk contract is deliberately less generous (i.e., low coverage) to prevent low-risk individuals from choosing it.
c. The low-risk contract is deliberately less generous (i.e., low coverage) so that high-risk individuals do not wish to select it.
d. Both contracts have identical coverage, differing only in price, because this is what creates separation.

5. If a monopolist engages in perfect price discrimination, then:

a. Marginal revenue coincides with the demand function; there is no deadweight loss; and consumer surplus is fully captured by the monopolist.
b. Marginal revenue is equal to half of demand; deadweight loss is maximised; and consumer surplus increases.
c. Price becomes equal to marginal cost for all consumers; there is no deadweight loss; but consumer surplus necessarily increases.
d. Demand becomes more elastic, and the monopolist reduces output relative to a simple monopoly.

6. For a monopolist engaging in third-degree price discrimination across two markets without arbitrage, it is correct to state that:

a. The price is higher in the market where demand is more elastic, because fewer units are sold there.

b. The price is higher in the market where demand is less elastic, because the optimal mark-up is greater.
c. The price must be identical across both markets if marginal costs are equal.
d. The optimal mark-up is the same across both markets, regardless of demand elasticities.

7. In a sequential game, a strategy involving a non-credible threat may:

a. Be a Nash equilibrium, but not a subgame perfect equilibrium.
b. Be a subgame perfect equilibrium, but not a Nash equilibrium.
c. Be both, because threats are irrelevant in equilibrium.
d. Not be a Nash equilibrium, because Nash equilibrium requires credibility.

8. Consider the game below, where the first (second) number in each cell represents the payoff of Firm 1 (Firm 2). Suppose the game is repeated a finite and known number of times. Assuming rationality and common knowledge among players, it can be stated that:

a. Cooperation can be sustained through trigger strategies if both firms care sufficiently about the future.
b. Defection from cooperation occurs only in the final period; before that, cooperation may be sustained.
c. The outcome is unknown, since finite games may have multiple equilibria.
d. Defection from cooperation occurs in every period through backward induction.

		Firm 2	
		Cooperate	**Defect**
Firm 1	**Cooperate**	3,3	0,5
	Defect	5,0	1,1

9. Under a two-part tariff with identical consumers and perfect information about demand, the standard profit-maximising rule, without excluding consumers, is:

a. Set the unit price equal to marginal cost and use the fixed fee to capture consumer surplus.
b. Set the unit price above marginal cost and the fixed fee equal to zero in order to reduce consumption and increase revenue.
c. Set the unit price below marginal cost and compensate with a very high fixed fee.
d. Set the unit price equal to average cost and the fixed fee equal to zero.

10. Even when collusion increases joint profits, it is often unstable because:

a. Each firm is indifferent between deviating and complying, so small shocks always break the agreement.
b. The collusive price is necessarily lower than the competitive price, reducing the incentive to collude.

c. Each firm has an incentive to deviate by secretly increasing output to gain in the short run, even though this reduces joint profits.
d. Collusion is always stable when there are only a few firms, regardless of monitoring.

11. In the long run under monopolistic competition -- with entry until economic profits are zero for the potential entrant -- the typical incumbent firm:

a. Produces at the minimum of average cost and charges a price equal to marginal cost.
b. Produces to the right of the minimum of average cost, because demand is tangent to marginal cost.
c. Does not exhibit excess capacity if demand is tangent to average cost.
d. Produces to the left of the minimum of average cost, with price equal to average cost, but above marginal cost.

12. Two firms, A and B, sell a homogeneous product under Bertrand price competition. Firm A has a marginal cost of $MC_A = 20$, while firm B has a marginal cost of $MC_B = 30$. Consumers buy from the cheapest firm, and if prices are equal, demand is split equally. Assume that firms can only choose integer prices (i.e., whole-number prices). What is the Bertrand-style Nash equilibrium?

a. $p_A = 31, p_B = 30;$
b. $p_A = 29, p_B = 30;$
c. $p_A = 20, p_B = 30;$
d. $p_A = 20, p_B = 20;$

13. Consider two identical firms selling a homogeneous good in a linear market [0,1], with consumers uniformly distributed along the interval. Consumers incur transportation costs that increase with distance. The game unfolds in two sequential stages:

- Stage 1: Firms simultaneously choose their locations;
- Stage 2: Firms simultaneously choose prices.

Which of the following statements correctly describes the equilibrium outcome in this context?

a. Firms tend to locate very close to one another, typically at the centre of the market, in order to maximise captured demand before price competition occurs.
b. Firms choose to locate on opposite sides of the linear market, increasing spatial differentiation in order to soften price competition in the second stage.
c. Firms distribute themselves randomly across the market, since location does not affect profits when goods are otherwise homogeneous.
d. Firms choose extreme locations because this minimises consumers' total transportation costs and maximises social welfare.

14. Consider a market initially served by a single incumbent firm earning positive economic profits. Potential competitors can observe the incumbent's behaviour and decide whether to enter the market. Assume that entry requires an initial investment that cannot be recovered upon exit; this

investment constitutes a sunk cost; and there are no information asymmetries or technological advantages between firms. Which of the following statements is correct?

a. The presence of sunk costs increases competitive pressure on the incumbent because it discourages high-price strategies after entry.
b. The existence of sunk costs is irrelevant for market entrance, provided firms can otherwise enter freely.
c. High sunk costs may reduce market entrance, even when the incumbent sets prices above marginal costs.
d. Market entrance depends only on demand conditions and technology, and is independent of entry costs.

15. A city is deciding how much to invest in a flood protection system that benefits all residents. Economists explain that the total demand curve for a public good is obtained by _____ individual willingness to pay, because the good is _____. By contrast, demand for a private good is obtained by _____ quantities demanded. Which option correctly completes the sentence?

a. horizontally summing – rival – vertically summing
b. vertically summing – rival – averaging
c. horizontally summing – non-rival – vertically summing
d. vertically summing – non-rival – horizontally summing

16. A municipality is considering the creation of a new urban park that is regarded as a pure public good. Each resident has different preferences regarding the value of the park, but no one can be excluded from enjoying it if it is built. The municipality seeks to design a mechanism to determine how much to invest in the park and how to finance the project. Which of the following statements correctly describes the main economic obstacle to the efficient provision of this public good?

a. The fundamental problem is that individuals have an incentive to understate their valuation, hoping to benefit from the park without significantly contributing, leading to under provision.
b. The central issue is that, because the benefit is identical for everyone, each resident has an incentive to reveal their true valuation, thereby generating efficiencies.
c. Optimal provision requires everyone to pay exactly the average of all individual valuations, eliminating strategic behaviour.
d. The central problem is that the total cost of the park increases faster than the sum of individual utilities, making provision always inefficient regardless of preferences.

PART B
OPEN QUESTIONS (10 points / 40 min)

Question 1 (5 points)

A group of tourists is going on an extreme skiing trip in Greenland. In the event of a serious accident, the total cost (rescue + medical treatment) is:

$$C = €36$$

Each tourist has an initial wealth of:

$$W_0 = €100$$

There are two types of tourists:

- Type L (low risk), with accident probability:
$$p_L = 0.1$$
- Type H (high risk), with accident probability:
$$p_H = 0.4$$

All tourists have the same utility function:

$$U(W) = \sqrt{W}$$

The insurance market is competitive, and the premiums are such that insurance companies make expected profits of zero. Recall that full insurance is characterised by a premium π, which is always paid, while the insurer reimburses the full loss C in the event of an accident.

a) Suppose the insurer can observe the type of each tourist (L or H). Calculate the actuarially fair premium for full insurance for each type (π_L and π_H). Show that both types prefer to purchase full insurance against this fair premium. (2 points)

b) Calculate the maximum premium that each type would be willing to pay for full insurance ($\pi_L^{\max}$ and $\pi_H^{\max}$). Briefly explain why this maximum willingness to pay differs from the actuarially fair premium. (1.5 points)

c) Suppose now that the insurer cannot distinguish between L and H and only knows that half of the tourists are type L and half are type H. The insurer offers a single full insurance contract against premium π_{pool}. Calculate the pooled actuarially fair premium assuming both types purchase the contract. Verify whether, at that premium, both types wish to purchase full insurance. (1.5 points)

Question 2 (5 points)

Consider the ski rental market in Greenland. Initially, the market is served by one incumbent firm, PrimeSki. A potential competitor, ExtremeSki, may enter the market. Suppose that, if both firms operate in the market, competition takes place in quantities and the product is homogeneous. The inverse market demand is:

$$P(Q) = 500 - 4Q$$

where

$$Q = q_P + q_E$$

Both firms have the same cost function:

$$C(q_j) = 20q_j$$

for $j = P, E$.

Given that PrimeSki is the incumbent firm, consider the following Stackelberg game:

- Stage 1: PrimeSki chooses its quantity q_P.
- Stage 2: ExtremeSki observes q_P and chooses its quantity q_E.

a) Determine the Stackelberg equilibrium quantities, market price, and profits of both firms. Clearly explain the steps of your calculations. (2 points)

b) Suppose instead that the two firms choose quantities simultaneously. Determine the Cournot equilibrium quantity of PrimeSki. Compare it to PrimeSki's quantity in the Stackelberg equilibrium and explain the intuition for the difference. (2 points)

c) Suppose now that ExtremeSki must pay a fixed entry cost $F > 0$ to enter the market. Without calculations, explain how F affects the likelihood of entry. Your explanation should include that, depending on F, PrimeSki may strategically use a high output level to discourage entry. (1 point)

Question 1

a) The actuarily fair premium is such that expected profits of insurers are zero:

$$profits = \pi_j - p_j C = 0$$

Hence, $\pi_L = 0.1 * 36 = 3.6$ and $\pi_H = 0.4 * 36 = 14.4$.

Note that a fair premium allows each consumer to get their EV for sure. To see this, for the low- and high-risk type we have that:

$$EV_L = 0.1 * 100 + 0.9 * (100 - 36) = 96.4$$
$$EV_H = 0.6 * 100 + 0.4 * (100 - 36) = 85.6$$

and with a full insurance against a fair premium they can get this EV for sure. Both types have a concave utility function, and hence are risk averse, such that they prefer utility of expected value than expected utility. Hence, they prefer to fully insure against a fair premium.
For the low risk type we can confirm this by:

$$U(EV_L) = \sqrt{96.4} = 9.82$$
$$EU_L = 0.9 * \sqrt{100} + 0.1 * \sqrt{100 - 36} = 9.8$$

For the high risk type we can confirm this by:

$$U(EV_H) = \sqrt{85.6} = 9.25$$
$$EU_L = 0.6 * \sqrt{100} + 0.4 * \sqrt{100 - 36} = 9.2$$

Hence, $U(EV_j) > EU_j$ for each j.

b) To find the maximum amount we are willing to pay for full insurance we need to know the certainty equivalent (CE): the minimum amount we accept in order to have no risk.

$$U(CE) = EU$$

We can calculate this for both types:

$$L: U(CE_L) = 9.8 \rightarrow CE_L = 9.8^2 = 96.04$$
$$H: U(CE_H) = 9.2 \rightarrow CE_H = 9.2^2 = 84.64$$

Hence, the maximum premium for both types is:

$$L: \pi_L^{\max} = 100 - 96.04 = 3.96$$
$$H: \pi_H^{\max} = 100 - 84.64 = 15.36$$

Since both types are risk averse, this maximum premium is larger than the actuarially fair premium. That is, in principle, they would be willing to pay a "premium" to reduce risk.

c) The actuarily fair pooled premium is such that expected profits of insurers are zero:

$$profits = \pi_{pool} - (0.5p_L + 0.5p_H)C = 0$$

Hence, $\pi_{pool} = (0.5 * 0.1 + 0.5 * 0.4) * 36 = 9$. This is far above the maximum premium the low type is willing pay for full insurance, since $\pi_L^{\max} = 3.96$. Hence, the low type will not insure, and will "adversely" select out of the market.

Note: this implies that the pooled insurance premium may not be sustainable, as the insurer will make a loss only insuring high risk type tourists against π_{pool}, and the fair premium may rise to π_H calculated under question a.

Question 2

a) To find the Stackelberg equilibrium, we use backwards induction and start with the follower's best response. ExtremeSki's profit function is:

$$\pi_E = (500 - 4q_E - 4q_P)q_E - 20q_E$$

Maximize profits by setting first derivative to zero:

$$\frac{\partial \pi_E}{\partial q_E} = 500 - 8q_E - 4q_P - 20 = 0$$

Solve for q_E to find the BRF:

$$q_E = 60 - 0.5q_P$$

By backwards induction, the profit function of the leader takes BRF of the follower into account:

$$\pi_P = (500 - 4q_P - 4q_E)q_P - 20q_P$$
$$= (500 - 4q_P - 4(60 - 0.5q_P))q_P - 20q_P$$
$$= (260 - 2q_P)q_P - 20q_P$$

Maximize profits by setting first derivative to zero:

$$\frac{\partial \pi_P}{\partial q_P} = 260 - 4q_P - 20 = 0$$

Solve for Stackelberg q_P

$$q_P = 60$$

And now we can use this to find Stackelberg q_E (fill q_P in BRF of follower), price, and profits:

$$q_P = 60$$
$$q_E = 30$$
$$p = 140$$
$$\pi_P = 7200$$
$$\pi_E = 3600$$

b) From question a) we already have ExtremeSki's (the follower's) best response function:

$$q_E = 60 - 0.5q_P$$

Since the problem is symmetric, this implies that PrimeSki has the same best response function:

$$q_P = 60 - 0.5q_E$$

We can solve for Cournot q_P:

$$q_P = 60 - 0.5(60 - 0.5q_P)$$
$$q_P = 40$$

Note that q_P is lower under Cournot than under Stackelberg. The reason is that under Stackelberg the leader will optimally commit to producing more, as this "forces" the follower to produce less.

c) There are basically three scenarios:

- (1) F is very high: ExtremeSki will never enter, even if PrimeSki will choose to maximize profits by restricting quantity to the monopoly output.
- (2) F is moderately high: ExtremeSki enters if PrimeSki chooses the Stackelberg quantity, but it is worthwhile for PrimeSki to strategically deter entry by producing more than the Stackelberg quantity such that ExtremeSki does not enter.
- (3) F is low: ExtremeSki enters if PrimeSki chooses the Stackelberg quantity, and since F is low it is not worthwhile for PrimeSki to strategically deter entry. Hence, ExtremeSki enters.