Regular-Period Exam — Multiple-Choice Questions

Maximum duration of this part: 50 minutes

Full Name: …… b

Student Number: …… Class: ……

1. Mark your answers with an 'O' in the table below. You get 0.625 marks for each right answer, and a 0.625/3 (≈0.208) deduction for any wrong answer.
2. You cannot look up books or notes of any kind. Invigilators will not help you with the test.
3. You cannot use any calculators in this part. Switch off and put away any mobile phones, computers, and any other data storage device.
4. This test paper must be returned to the invigilator even if you decide to quit.

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	a
b	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	c
d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d

1. To maximise total profit, the cartel's members must:
   a) All produce the same quantity.
   b) Equalise average costs.
   c) Equalise marginal costs.
   d) Equalise average variable costs.

2. Monopolistically competitive firms in the long run:
   a) Make positive profits.
   b) Operate with marginal revenue above marginal cost.
   c) Produce the minimum-average-cost output level.
   d) Charge a price equal to the average cost.

3. A single-price monopolist charges a price:
   a) Equal to marginal cost.
   b) Higher than marginal cost.
   c) Equal to marginal revenue.
   d) Lower than marginal revenue.

4. A monopolist faces demand $p = 100 - y$ and has constant marginal cost 20. Its profit-maximising quantity is:
   a) $y = 10$.
   b) $y = 20$.
   c) $y = 40$.
   d) $y = 50$.

5. The Stackelberg leader will get a profit that is:
   a) Lower than it would be in a Cournot model.
   b) Lower than the Stackelberg follower's profit.
   c) Higher than the single-price monopolist's profit.
   d) None of the other answers are correct.

6. A quantity discount is an example of:
   a) First-degree price discrimination.
   b) Second-degree price discrimination.
   c) Third-degree price discrimination.
   d) None of the other answers are correct.

7. Ed and Ana play a simultaneous game with a single Nash equilibrium. When Ana does NOT play her equilibrium strategy, Ed's best response:
   a) Is his equilibrium strategy.
   b) Is a strategy other than his equilibrium strategy.
   c) Is a mixed strategy.
   d) Depends on the game payoffs.

8. Consider the payoff matrix below. In a simultaneous game, (B, L) is the only Nash equilibrium if:

	L	R
T	x, 10	y, 8
B	8, 15	12, 12

   a) $x = 10$, $y = 15$.
   b) $x = 8$, $y = 15$.
   c) $x = 6$, $y = 10$.
   d) $x = 10$, $y = 10$.

9. Ed maximises expected utility. He is indifferent between earning €5 or tossing a coin to get €10 if heads or nothing if tails. Then Ed is:
   a) Risk averse.
   b) A risk lover.
   c) Risk neutral.
   d) The information is insufficient to answer.

10. Ed faces a potential loss and can buy insurance at a fair rate. He is risk averse. He maximises utility with:
    a) Full insurance.
    b) Partial insurance.
    c) No insurance.
    d) The information is insufficient to answer.

11. In a market where consumers cannot tell good from bad quality before purchase, there is adverse selection when:
    a) Some consumers pay more for the product than what it is worth to them.
    b) Sellers of the good product have to sell at the same price as the bad product.
    c) Consumers have less information than sellers.
    d) None of the other answers are correct.

12. The good product is sold if $p \geq$ €5; the bad if $p \geq$ €2. Consumers value the bad product at €3; the good at €9, but cannot tell quality before purchase. To serve as a signal, a guarantee can cost a seller of good products any amount:
    a) Less than €6.
    b) Less than €3.
    c) Less than €4.
    d) Less than €5.

13. Ana and Ed share a public good. For the present quantity, $MRS_A = 1.1$ (marginal rate of substitution, quantity of private good per unit of public good) and $MRS_B = 0.7$. One unit of public good costs two of private good. Then the Pareto-efficient quantity is:
    a) The present one.
    b) Higher than the present one.
    c) Lower than the present one.
    d) The information is insufficient to answer.

14. Which of the following is a good example of public good?
    a) Education.
    b) A non-congested Tagus bridge.
    c) Night street lighting in Lisbon.
    d) None of these goods is an example of public good.

15. In a certain perfectly competitive market, production gives rise to an external benefit. Then the equilibrium quantity is (without any government action):
    a) Lower than the Pareto-efficient quantity.
    b) Higher than the Pareto-efficient quantity.
    c) Pareto efficient.
    d) It can be Pareto efficient, higher, or lower.

16. According to the Coase theorem, in which of the following is it more likely that private negotiation will achieve a Pareto-efficient outcome?
    a) Heavy traffic disturbs local residents.
    b) A large farm uses a pesticide that harms a neighbouring beekeeper.
    c) Because of single-crop farming, the town's surrounding countryside had become less pleasurable.
    d) Many drivers trying to access a bridge at the same time are causing delays to everybody.

Repeat-Period Exam — Open Questions

Maximum duration of the exam: 2 hours

1. You cannot look up books or notes of any kind. Invigilators will not help you with the test.
2. Switch off and put away any graphical calculators, computers, mobile phones, or any other data storage device.

QUESTION 1 (3.5 marks)

The two parts are independent.

a) [2 marks] In a certain market the inverse demand curve is $p(y) = 70 - y$. There are two firms only with cost functions $c_1(y_1) = 0.5y_1^2$ e $c_2(y_2) = 10y_2$. The firms form a cartel. Find the cartel's profit-maximising price and quantities and the individual profits. Explain you reasoning.

b) [1.5 marks] Why is it said that there is excess capacity in the monopolistic competition long-run equilibrium? Rigorously explain.

QUESTION 2 (3.5 marks)

The two parts are independent.

a) [1.5 marks] Consider the payoff matrix below. The two players simultaneously and separately choose strategies (pure strategies only). Find the equilibrium(s).

		Bob	
		L	*R*
Ana	*T*	2, 2	0, 4
	D	4, 0	-5, -5

b) [2 marks] Ed has initial wealth $w_0 = 100$ and faces a 50% chance of losing 64. He maximises expected utility and has utility from wealth $u(w) = w^{0.5}$. Find the maximum price he would be willing to pay for full insurance. Explain and illustrate in a graph.

QUESTION 3 (3 marks)

A community is made up of two people who share a public good. They have marginal willingness to pay $p_1(G) = 40 - G$ and $p_2(G) = 30 - 1.5G$ where G is the quantity of public good. The public good is produced with constant marginal cost $MC = 15$.

a) [1.5 marks] Find the aggregate marginal willingness to pay for, and the socially optimal quantity of, the public good.

b) [1.5 mark] Now the marginal cost is $MC = 25$. Find the total surplus at the socially optimal level of the public good.

Answers to the multiple-choice questions

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

Answers to the open questions

Question 1

a) Total profit is maximised with $MC_1 = MC_2 = MR$. $MC_2 = 10$, then $MC_1 = MR = 10$.
Revenue: $r(y) = p(y)y = (70 - y)y = 70y - y^2$
Marginal revenue: $MR = r'(y) = 70 - 2y = 10 \Leftrightarrow y = 30$.
$MC_1 = c_1'(y_1) = y_1 = 10$.
Then $y_1 + y_2 = y \Leftrightarrow 10 + y_2 = 30 \Leftrightarrow y_2 = 20$.
Price: $p(30) = 40$.
$\pi_1 = 40 \times 20 - 10 \times 20 = 600$.
$\pi_2 = 40 \times 10 - 0.5 \times 10^2 = 350$.

b) See Varian, "Monopolistic Behaviour – Monopolistic Competition," especially the part towards the end about the long-run equilibrium.

Question 2

a) There are two Nash equilibria: (*T*, *R*)—*T* is Ana's best response to Bob's *R*, and *R* is Bob's best response to Ana's *T*; and (*D*, *L*))—*D* is Ana's best response to Bob's *L*, and *L* is Bob's best response to Ana's *D*.

b) Let *p* be the insurance premium. With full insurance, Ed will have wealth 100 – *p* for certain (initial wealth minus the insurance premium; if the loss occurs, Ed will get it all back from the insurance company). With no insurance, Ed's wealth will be 100 with 50% probability and 100 – 64 = 36 with the remaining 50% probability. Ed will be willing to buy full insurance (assuming no partial insurance is available) as long as he gets as much utility as his expected utility without any insurance:
$u(100 - p) \geq 0.5u(100) + 0.5u(36) \Leftrightarrow (100 - p)^{0.5} \geq 0.5 \times 100^{0.5} + 0.5 \times 36^{0.5} \Leftrightarrow p \leq 36$.

Question 3

a) The aggregate willingness to pay is $p(G) = p_1(G) + p_2(G) = 70 - 2.5G$ if $G \leq 20$ (because $p_2(G)$ is defined for $G \leq 20$ only) and it is $p(G) = p_1(G) = 40 - G$ for $G > 20$ (if $G > 20$, only person 1 is willing to pay anything for an additional unit). So (the figure shows the nonvalid section of each branch in light grey):

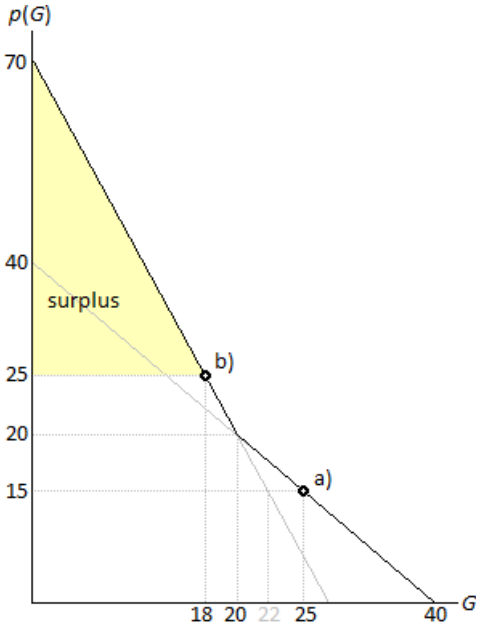
$$p(G) = \begin{cases} 70 - 2.5G & if \quad G \leq 20 \\ 40 - G & if \quad G > 20 \end{cases}$$

The socially optimal quantity is that that equates aggregate willingness to pay to marginal cost:

— For $G \leq 20$: $p(G) = p_1(G) + p_2(G) = MC \Leftrightarrow 70 - 2.5G = 15 \Leftrightarrow G = 22 > 20$, so not on the valid section of this branch.

— For $G > 20$: $p(G) = p_1(G) = MC \Leftrightarrow 40 - G = 15 \Leftrightarrow G = 25$, so on the valid section of this branch.

So the socially optimal quantity is 25.



b) Now, for $G. \leq 20$, $p(G) = p_1(G) + p_2(G) = MC \Leftrightarrow 70 - 2.5G = 25 \Leftrightarrow G = 18$. Total surplus is equivalent to the shaded area in the picture: (70 – 25) x 18/2 = 405.