LISBON SCHOOL OF ECONOMICS & MANAGEMENT
UNIVERSIDADE DE LISBOA

Microeconomics I

Licenciatura in Economics

30th of October of 2019
Duration: 50m + 40m

Regular-Period Exam — Part A

Maximum duration of Part A: 50 minutes

Full Name: .... A

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.

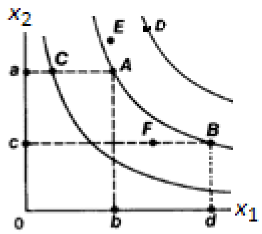
ANSWER TABLE

	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. With goods *A* and *B*, prices p_A and p_B, and income *m*, which of the following represents the budget line?
   a) $m = p_BA + p_AB$.
   b) $B = m/p_A - p_BA/p_A$.
   c) $A = m/p_A - p_AC/p_B$.
   d) None of the other alternatives is correct.

2. All bundles on or below the budget line:
   a) Are affordable.
   b) Are equally desirable.
   c) Exhaust income.
   d) None of the other alternatives is correct.

3. Assume preferences shown in the figure are monotonic. Then the consumer prefers:
   a) *A* to *B*.
   b) *C* to *B*.
   c) *B* to *D*.
   d) *E* to *F*.



4. Ana's indifference curves are of the form $x_2 = k/(x_1 + 1)$, where the higher *k* the more preferred the bundle is. Then:
   a) Ana prefers bundle (4, 6) to bundle (6, 4).
   b) Ana prefers bundle (8, 5) to bundle (5, 8).
   c) Ana loves good 1 and hates good 2.
   d) Ana loves good 2 and hates good 1.

5. If preferences are monotonic, indifference curves are:
   a) Negatively sloped.
   b) Positively sloped.
   c) Vertical.
   d) Horizontal.

6. Ed loves beer (*B*) and hates wine (*W*). Which of the following utility functions is consistent with this preferences?
   a) $u(B, W) = B + W$.
   b) $u(B, W) = BW$.
   c) $u(B, W) = B/W$.
   d) $u(B, W) = (B + W)^{0.5}$.

7. The income expansion path is the set of optimal bundles arising from:
   a) Different levels of the price of one of the goods.
   b) Different preferences.
   c) Different levels of income.
   d) None of the other alternatives is correct.

8. For Ana, goods *X* and *Y* are perfect substitutes. If the price of *X* rises, Ana will:
   a) Buy more good *Y*.
   b) Buy less good *Y*.
   c) Buy the same amount of good *Y* as before.
   d) The information is not enough to answer.

9. At prices (5, 1), Ed buys bundle (6, 3), and at prices (p_x, p_Y) he buys bundle (5, 7). These choices are consistent with the weak axiom of revealed preference if:
   a) $6p_X + 3p_Y > 5p_X + 7p_Y$.
   b) They are consistent for any prices (p_x, p_Y).
   c) $6p_X + 3p_Y < 5p_X + 7p_Y$.
   d) They cannot be consistent.

10. Prices are $p_1 = 5$ and $p_2 = 8$. If Ed buys the bundle (10, 23) he will spend all his income and will have marginal utilities $MU_1 = 2$ and $MU_2 = 4$. Ed will increase his utility if he:
    a) Consumes more good 1 and less good 2.
    b) Consumes more good 2 and less good 1.
    c) Consumes equal quantities of both goods.
    d) Consumes good 1 only.

11. Ed has strictly convex preferences, and presently his optimal bundle is (5, 5). Then his income and the price of good 1 increase so that bundle (5, 5) is still on his new budget line. How does Ed's optimal bundle change?
    a) It will not change.
    b) It will have more good 2 and less good 1.
    c) It will have more good 1 and less good 2.
    d) The information is not enough to answer.

12. A price rises. For which of the following preferences will the substitution effect be zero?
    a) Cobb-Douglas preferences.
    b) Quasi-linear preferences.
    c) Perfect complements.
    d) None of the other alternatives is correct.

13. Ed's endowment is (4, 3), and his gross demand is (5, 2). Then his net demand is:
    a) (9, 5).
    b) (1, -1).
    c) (-1, 1).
    d) (9, -5).

14. Consumption is a normal good. Then Ed's may have a negatively-sloped section if and only if:
    a) Leisure is a normal good.
    b) Leisure is an inferior good.
    c) Income-elasticity of demand leisure is zero.
    d) Non-wage income is very high.

15. Ed's preferences for consumption in periods 1 and 2 are described by $u(c_1, c_2) = c_1c_2$. He can borrow or lend at 6% interest rate. He earns the same income in both periods (there is no inflation). Then, in the first period:
    a) Ed will choose to borrow.
    b) Ed will choose to save.
    c) Ed will neither save nor borrow.
    d) The information is not enough to answer.

16. Ed consumes in two periods and can borrow or lend at interest rate *r*, and there is no inflation. Then the slope of the budget line is (first period on the horizontal axis):
    a) $-(1 + r)$
    b) $-r$.
    c) $-1/r$.
    d) $-1/(1 + r)$

Regular-Period Exam — Part B

Maximum duration of the exam: 90m

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

QUESTION 1 (4 marks)

Ed's preferences are described by the utility function $u(x_1, x_2) = x_1^{0.8}\, x_2^{0.4}$. Prices are $p_1 = 8$ and $p_2 = 12$, and Ed has income $m = 1200$.

a) [2 marks] Find Ed's optimal consumption bundle. Use either the Lagrangean method or the conditions the optimal consumption bundle must meet (that is, do not use rules for this or that type of preferences).

b) [1,5 marks] Find the demand function for good 1. Explain.

c) [1.5 marks] Show that good 1 is a normal good.

QUESTION 2 (4 marks)

Ed spends all his income on blackberries (*b*) and cream (*c*). These goods are perfect complements for Ed. Presently he buys 1 kg of blackberries and 1 kilo of cream a month.

a) [2 marks] Suggest a utility function that describes Ed's preferences. Then, on a graph, draw some indifference curves and a curve showing the bundles Ed will buy at different income levels.

b) [1.5 marks] Now the price of blackberries increased, and the price of cream decreased, but Ed's income is still just enough to buy his previous bundle (1 kilo of each good). How, if at all, will Ed's optimal bundle change? Explain and illustrate you reasoning in a graph.

c) Edwina's (a different person) preferences are described by the utility function $v(x_1, x_2) = x_1 + x_2$. Find a different utility function that describes the same preferences (a monotonic transformation). Explain.

Answers

Part A

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

Part B

Question 1

a) Let us start with the demand functions. These give the optimal quantities as a function of income and prices, which meet the following conditions:

The bundle is on the budget line: $p_1x_1 + p_2x_2 = m$ (1)

The budget line is tangent to the indifference curve:

$MRS = - p_1/p_2 \Leftrightarrow - 0.8x_1^{-0.2}x_2^{0.4}/(0.4x_1^{0.8}x_2^{-0.6}) = - p_1/p_2 \Leftrightarrow 2x_2/x_1 = = p_1/p_2 \Leftrightarrow x_2 = 0.5p_1x_1/p_2$ (2)

Substitute (2) into (1): $p_1x_1 + p_2(0.5\ p_1x_1/p_2) = m \Leftrightarrow 1.5\ p_1x_1 = m \Leftrightarrow x_1 = 2m/(3p_1)$

Substitute this back into (2): $x_2 = 0.5p_1[2m/(3p_1)]/p_2 = m/(3p_2)$

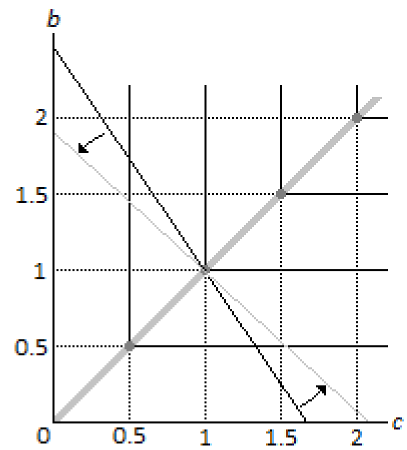
With $m = 1200$, $p_1 = 8$ and $p_2 = 12$, the optimal bundle is: $x_1 = 100$, $x_2 = 33.33(3)$.

b) The demand functions were found in part a): $x_1(p_1, m) = 2m/(3p_1)$; $x_2(p_2, m) = m/(3p_2)$

c) $\partial x_1/\partial m = 2/(3p_1) > 0$. That is, demand for good 1 increases when income increases, so good 1 is a normal good.

Question 2

a) The goods are perfect complements and Ed now buys 1 kg of each, so 1 to 1 is the right proportion for him. These preferences can be described by the utility function $u(b, c) = \min\{x_1, x_2\}$. The figure shows indifference curves, which are L-shaped. No matter what the prices and income are, the optimal bundle always is on the corner of the indifference curve. As income increases the optimal bundle moves outwards along the thick, grey curve, which is the income-expansion path.



b) The effect is shown on the figure. The budget line rotates anti-clockwise (as cream is on the horizontal axis), and the optimal bundle remains the same.

c) An example is $w(x_1, x_2) = x_1 + x_2 + 7 = v(x_1, x_2) + 7$. Then $\partial w/\partial v = 1 > 0$, that is, as $v(x_1, x_2)$ increases, so does $w(x_1, x_2)$ and vice-versa. So the two utility functions order the bundles in the same way. Therefore they describe the same preferences.