ECO000011

UNIVERSITY OF YORK

BA and BSc Degree Examinations
DEPARTMENT OF ECONOMICS AND RELATED STUDIES
ECO000011 MICROECONOMICS II
FIRST SPECIMEN EXAMINATION PAPER

Time allowed: THREE hours

Please use the answer sheets attached to the examination paper. Students should not bring their own electronic calculators; standard university electronic calculators will be provided at each desk.

There are 27 questions in sets of various sizes. Each set of questions is preceded by a *preamble*, which remains in force until the next *preamble*. Four marks are awarded for each correct answer and one mark will be deducted for each wrong answer. The resulting mark, denoted by *x* will be between -27 and 108. It will then be converted into a final mark for this module *y* using the formula *y = (x+27)/1.35*, which ensures that the final mark will lie between 0 and 100.

Preamble: Consider a market for a hypothetical good in which there are a number of buyers and sellers, each of which wants to buy or sell one unit of the good. The reservation prices for the buyers are 9, 7, 11 and 7. The reservation prices of the sellers are 6, 10 and 6.

Question 1: What is the maximum quantity demanded?

Ⓐ 5
Ⓑ 4
Ⓒ 7
Ⓓ 6
Ⓔ 3

Question 2: What is the maximum quantity supplied?

Ⓐ 6
Ⓑ 2
Ⓒ 3
Ⓓ 8
Ⓔ 4

Question 3: At what price or prices is aggregate demand equal to aggregate supply? (If the demand or supply at a price consists of a *set* of values because some buyers are indifferent about buying at that price or some sellers are indifferent about selling at that price, then interpret this condition as being satisfied if there is some possible value of aggregate demand at that price which is equal to some possible value of aggregate supply at that price).

Ⓐ Any price between 7 and 9
Ⓑ 7
Ⓒ 9
Ⓓ Any price between 7 and 8
Ⓔ Any price between 6 and 9

Question 4: What is the quantity exchanged when the price is such that aggregate supply equals aggregate demand?

Ⓐ 4

Ⓑ 2
Ⓒ 1
Ⓓ 5
Ⓔ 3

Preamble: Consider an individual with quasi-linear preferences whose indifference curve between money (on the vertical axis) and the quantity of a DISCRETE good (on the horizontal axis) is as given in Figure 1 attached to this script. Suppose the individual starts with an endowment at the point marked X in the figure. Suppose there is a market in which the DISCRETE good can be sold or bought at a fixed price. Suppose the price at the moment is 15. (You might like to know that the equation of the curve is $m = 60/q$ where m and q are the variables on the vertical and horizontal axes respectively.)

Question 5: State whether the individual will be a buyer or a seller and how many units he or she will buy or sell at this price.

Ⓐ sell 1
Ⓑ sell 2
Ⓒ buy 1
Ⓓ do nothing
Ⓔ buy 2

Question 6: What will the individual's surplus be at this price?

Ⓐ 12
Ⓑ 3
Ⓒ 5
Ⓓ 0
Ⓔ 4

Preamble: Consider an individual with quasi-linear preferences whose indifference curves between money (on the vertical axis) and the quantity of a CONTINUOUS good (on the horizontal axis) are as given in Figure 2 attached to this script. Suppose the individual starts with an endowment at the point marked X in the figure. Suppose there is a market in which the CONTINUOUS good can be sold or bought at a fixed price. Also inserted in the figure are the budget lines for 4 different prices. Suppose the price is such that the individual's optimal decision is to buy 2 units. (You might like to know that the equation of the curve is $m = 60/q$ where m and q are the variables on the vertical and horizontal axes respectively.)

Question 7: What approximately is the price in the market?

Ⓐ 0
Ⓑ 3.7
Ⓒ 20
Ⓓ 15
Ⓔ 2.4

Question 8: What approximately is the individual's surplus at this price?

Ⓐ 16
Ⓑ 5
Ⓒ -2
Ⓓ 0
Ⓔ 3.2

Preamble: Consider an individual whose preferences are either Perfect Substitutes, Perfect Complements or Cobb-Douglas with parameter *a*, allocating a given endowment between two goods whose prices are *p* and 1 respectively. The individual's endowments of the two goods are 15 and 8 respectively. In the first situation the price *p* of Good 1 was 0.5 and the individual chose to consume 15.5 of Good 1 and 7.75 of Good 2. In the second situation the price *p* of Good 1 was 2 and the individual chose to consume 15.2 of Good 1 and 7.6 of Good 2.

Question 9: What are the individual's preferences?

Ⓐ There can never be enough information to tell
Ⓑ Perfect Substitutes
Ⓒ Cobb-Douglas
Ⓓ Perfect Complements
Ⓔ There is not enough information to tell

Question 10: What is the value of the parameter *a*?

Ⓐ 1/2
Ⓑ 3
Ⓒ 1/3
Ⓓ 1
Ⓔ 2

Preamble: Consider an individual whose preferences are either Perfect Substitutes, Perfect Complements or Cobb-Douglas with parameter *a*, allocating a given monetary income between two goods whose prices are *p* and 1 respectively. The individual's endowment of money is 80. In the first situation the price *p* of Good 1 was 1 and the individual chose to consume 20 of Good 1 and 60 of Good 2. In the second situation the price *p* of Good 1 was 1/3 and the individual chose to consume 60 of Good 1 and 60 of Good 2.

Question 11: What are the individual's preferences?

Ⓐ Cobb-Douglas
Ⓑ There can never be enough information to tell
Ⓒ There is not enough information to tell
Ⓓ Perfect Substitutes
Ⓔ Perfect Complements

Question 12: What is the value of the parameter *a*?

Ⓐ 1/4
Ⓑ 1/3
Ⓒ 1
Ⓓ 2
Ⓔ 1/2

Preamble: Consider competitive exchange of two goods, Good 1 and Good 2, between two Individuals A and B. A starts with an endowment of 12 units of Good 1 and none of Good 2. B starts with an endowment of 12 units of Good 2 and none of Good 1. Individual A has Perfect Complement Preferences with *a* parameter 2. Individual B has Cobb-Douglas Preferences with *a* parameter 2/3. (In answering this question you should note a convention that we use here: in order for a situation to be termed a competitive equilibrium we require that both individuals are STRICTLY better off than they were with their initial endowments.)

Question 13: Determine whether a competitive equilibrium exists, and if so, determine the competitive equilibrium exchange rate.

Ⓐ There is no competitive equilibrium
Ⓑ There is not enough information to tell.

Ⓒ Yes: exchange rate of 2 of good 1 for 1 of Good 2
Ⓓ Yes: exchange rate of 3 of good 1 for 2 of Good 2
Ⓔ Yes: exchange rate of 1 of good 1 for 1 of Good 2

Question 14: If a competitive equilibrium exists, how many units of good 1 are exchanged?
Ⓐ There is no competitive equilibrium
Ⓑ 3
Ⓒ 8
Ⓓ There is not enough information to tell
Ⓔ 4

Question 15: If a competitive equilibrium exists, how many units of good 2 are exchanged?
Ⓐ 2
Ⓑ There can never be enough information to tell.
Ⓒ There is no competitive equilibrium
Ⓓ 8
Ⓔ There is not enough information to tell.

Question 16: Would dividing EQUALLY the initial endowments of the two goods be an efficient way of finally allocating the two goods to the two individuals?
Ⓐ Yes
Ⓑ There is not enough information to tell
Ⓑ No
Ⓓ There can never be enough information to tell

Preamble: Consider a perfectly competitive firm with a quadratic cost function $C(q) = a + bq + cq^2$ where the parameters *a, b* and *c* are given below (note that the firm has to incur its fixed cost *a* whether it produces any output or not). Suppose that the given price for its output is 20. The value of *a* is 15, the value of *b* is 7, and the value of *c* is 2.
Question 17: What profit does it make at its profit-maximising (loss-minimising) output (a negative number if it makes a loss)?
Ⓐ -100
Ⓑ 100
Ⓒ 0
Ⓓ 6.125

Preamble: Consider a simple economy with two individuals, A and B, each of whom can produce both of two goods, 1 and 2. If A works full-time on Good 1, he or she can produce 7 units of Good 1; if A works full-time on Good 2, he or she can produce 9 units of Good 2; more generally, if he or she works a fraction *f* of his or her time on Good 1 and a fraction *(1-f)* of his or her time on Good 2 then he or she can produce a quantity 7*f* of Good 1 and a quantity 9*(1-f)* of Good 2. If B works full-time on Good 1, he or she can produce 14 units of Good 1; if B works full-time on Good 2, he or she can produce 11 units of Good 2; more generally, if he or she works a fraction *f* of his or her time on Good 1 and a fraction *(1-f)* of his or her time on Good 2 then he or she can produce a quantity 14*f* of Good 1 and a quantity 11*(1-f)* of Good 2. Suppose that they agree that they jointly want to produce 14 units of Good 1.
Question 18: Given their decision (above) on how much of Good 1 that they want to jointly produce, what is the maximum amount of Good 2 that the two individuals can produce?
Ⓐ 20
Ⓑ 11

Ⓒ 0
Ⓓ 9
Ⓔ 8

Preamble: An individual is observed spending his or her monetary income on two goods, 1 and 2, in two situations, the price of Good 2 always being 1. In the first situation the individual's income was 14 and the price of Good 1 was 1. The individual was observed to purchase 2 units of Good 1 and 12 units of Good 2.In the second situation the individual's income was 10 and the price of Good 1 was 2/3. The individual was observed to purchase 10 units of Good 1 and 3 1/3 units of Good 2.

Question 19: Does this behaviour violate the weak axiom of revealed preference?

Ⓐ No
Ⓑ There is not enough information to tell
Ⓒ Yes

Preamble: An individual has Perfect Substitute preferences over two goods, 1 and 2. The price of Good 2 is fixed at 1, and the individual's monetary income is 110. Initially the price of Good 1 is 1.0 but then it rises to 1.1.The value of the *a* parameter is 0.8.

Question 20: What is the Equivalent Variation of this price rise (that is, what reduction in his income would be equivalent to the effect of the price rise)?

Ⓐ 0
Ⓑ 10
Ⓒ 11
Ⓓ 21

Preamble: Consider an inter-temporal choice problem with two periods where an individual's preferences over consumption, c_1 and c_2, in two periods 1 and 2 is given by $U(c_1, c_2)=u(c_1) + u(c_2)/(1+ \rho)$ where ρ is the individual's discount rate (which should lie between 0 and 1) and $u(c)$ is the square root of c (that is, $u(c) = \sqrt{c}$).The first consumption stream gives 36 in the first period and 1 in the second; the second consumption stream gives 16 in the first period and 16 in the second.

Question 21: What discount rate (if any between 0 and 1) would make the individual indifferent between these two streams of consumption?

Ⓐ 0.5
Ⓑ 0.8
Ⓒ There is no discount rate between 0 and 1 which would make the individual indifferent
Ⓓ 0.9
Ⓔ There is not enough information to tell

Preamble: Consider an individual facing a risky choice (given below) who has preferences over risky choices given by the Expected Utility model. The individual's utility function is given by $u(x) = x^r$ where the parameter r (which indicates his risk attitude) is equal to 1. The risky choice gives outcome x equal to 45 with probability 0.4 and outcome x equal to 33 with probability 0.6.

Question 22: What is the individual's Certainty Equivalent for this risky choice (that is, what amount of money, received with certainty, would be equivalent for this individual to this risky choice)?

Ⓐ 45.0
Ⓑ 33.6
Ⓒ 40.0
Ⓓ 36.2

Ⓔ 37.8

Preamble: Consider a competitive market with linear demand and supply curves, as specified below. At the moment there is no tax imposed by the government.. The demand curve is given (in inverse form) by $P = 70 - Q$; the supply curve is given (in inverse form) by $P = 22 + 0.5Q$.

Question 23: Suppose that the government have decided to impose a tax at 10% of the price of the good. This will cause a higher price for the buyer, a lower price for the seller, and a deadweight loss of surplus in the market. Calculate this deadweight loss (to the nearest integer).

Ⓐ 0
Ⓑ 20
Ⓒ 5
Ⓓ 30
Ⓔ 10

Preamble: Consider a monopolist with a linear demand function (as given below) and a linear cost function (as given below). The demand curve is given (in inverse form) by $P = 81 - Q$; the cost function is given by $C(Q) = 39 + Q$.

Question 24: What are the monopolist's optimal price and output?

Ⓐ 0 and 81
Ⓑ 40 and 41
Ⓒ 41 and 40
Ⓓ 21 and 60
Ⓔ 81 and 0

Preamble: Consider a game between a row player (Individual A) and a column player (Individual B) where the payoff matrix is given in the 'table for the game theory questions' attached to this examination paper and is repeated here. The first row of the payoff matrix is [27,2][13,39] [33,49]. The second row of the payoff matrix is [8,12] [38,50] [40,23]. The third row of the payoff matrix is [23,25] [37,48] [15,5].

Question 25: List all the Nash Equilibrium of this game when played simultaneously.

Ⓐ [1;2]
Ⓑ There are no Nash Equilibria
Ⓒ [3;1]
Ⓓ [2;2]
Ⓔ [2;3]

Question 26: Now suppose we change the rules of the game: with New Rules 1 we let A move first and then B responds; with New Rules 2 we let B move first and then A responds; What is A's best optimal row decision with New Rules 1; and what is B's best column decision with New Rules 2?

Ⓐ A should choose row 2; B should choose column 2
Ⓑ A should choose row 1; B should choose column 3
Ⓒ A should choose row 2; B should choose column 1
Ⓓ A should choose row 1; B should choose column 2
Ⓔ There is not enough information to tell

Preamble: Consider a Cournot (quantity-setting) duopoly in which the aggregate demand curve (given below) and the cost functions (given below) are all linear. The demand curve is given (in inverse form) by $P = 86 - Q$, where Q is aggregate output; the cost function of firm 1 is given by $C(Q_1) = Q_1$, where Q_1 is the output of Firm 1; the cost function of firm 2 is given by $C(Q_2) = 2\,Q_2$, where Q_2 is the output of Firm 2; of course $Q = Q_1 + Q_2$.

Question 27: What are the equilibrium (Cournot) optimal outputs for the two firms?

Ⓐ 10 and 10
Ⓑ 28⅔ and 27⅔
Ⓒ 15⅔ and 12⅔
Ⓓ 10 and 10
Ⓔ 28 and 31

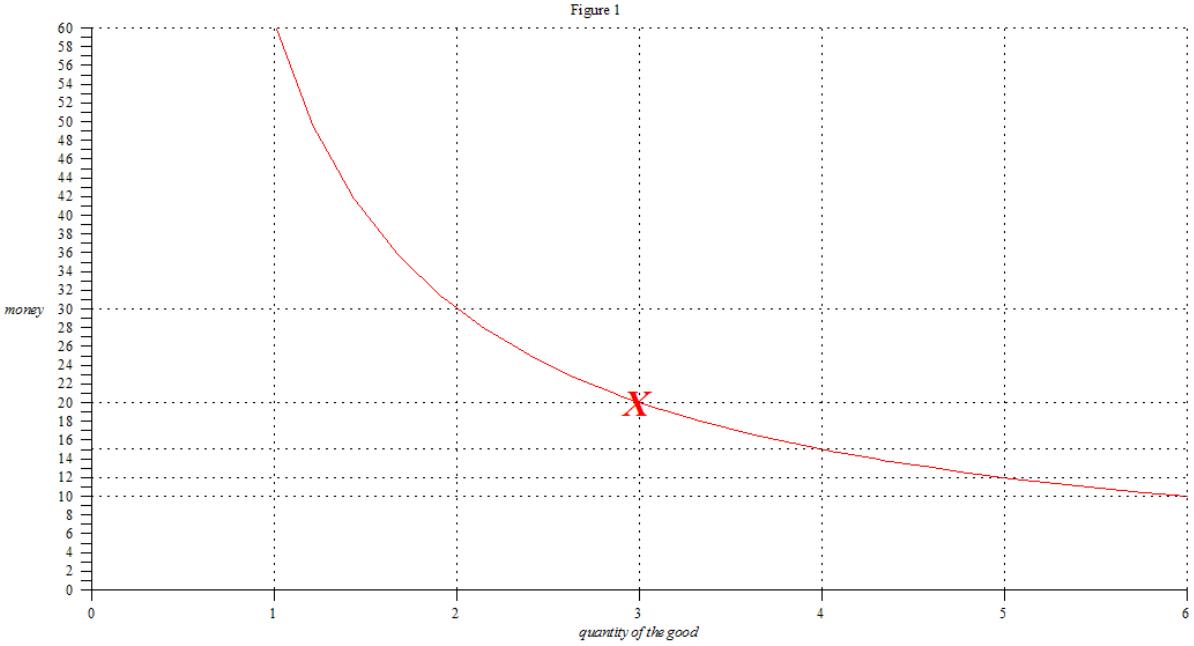
Aide-Memoire on Functions and their parameterisations

Perfect Substitutes with parameter *a*: $u(q_1, q_2) = q_1 + q_2 / a$

Perfect Complements with parameter *a*: $u(q_1, q_2) = \min(q_1, q_2 / a)$

Cobb-Douglas with parameter *a*: $u(q_1, q_2) = q_1^a q_2^{1-a}$

Figure 1


money
quantity of the good
X
0
1
2
3
4
5
6
0
2
4
6
8
10
12
14
16
18
20
22
24
26
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42
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56
58
60

Figure 2

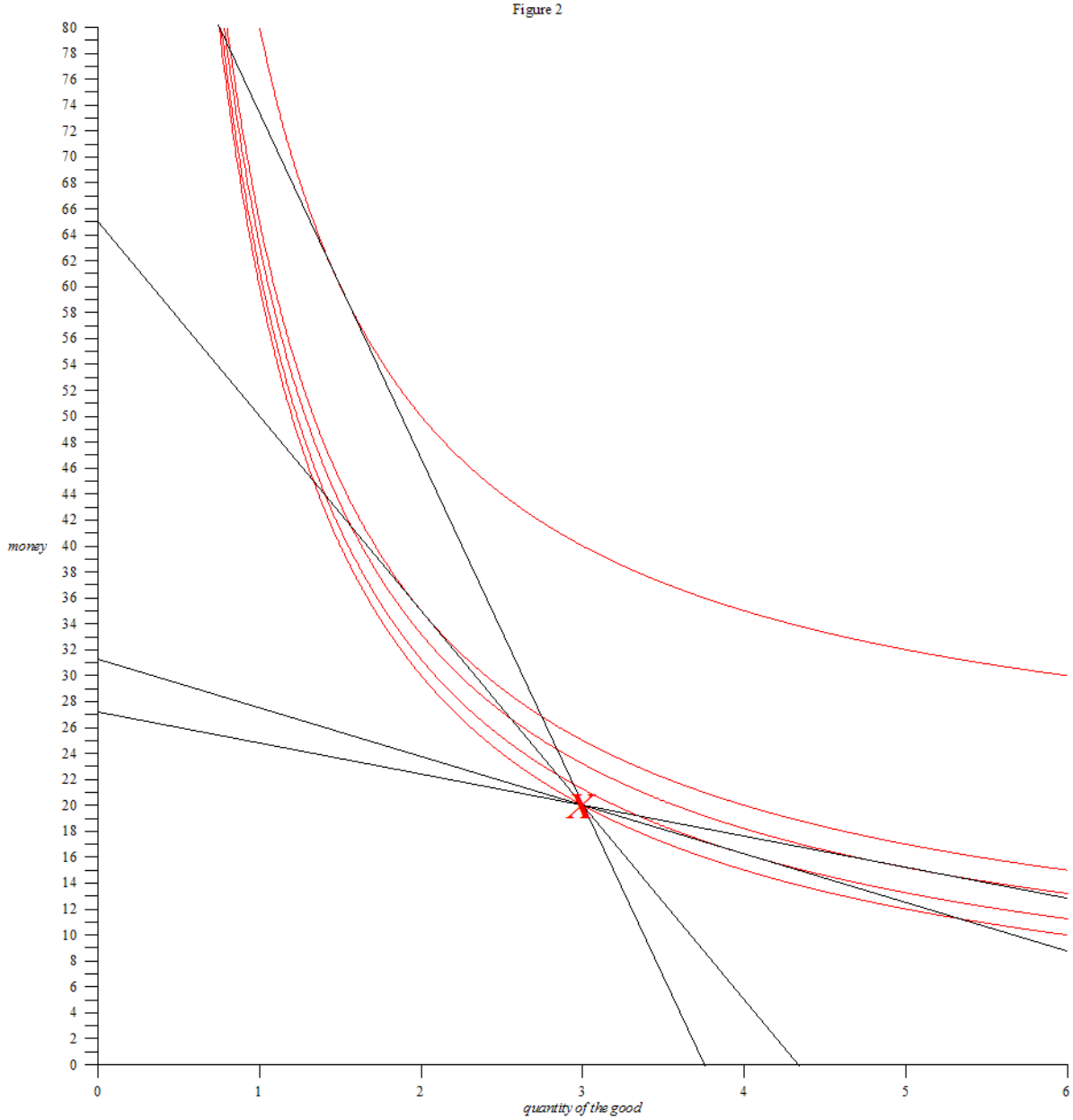

Table for questions 25 and 26		*Individual B*		
		Column 1	*Column 2*	*Column 3*
Individual A	*Row 1*	[27,2]	[13,39]	[33,49]
	Row 2	[8,12]	[38,50]	[40,23]
	Row 3	[23,25]	[37,48]	[15,5]